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ABSTRACT

This is a report on the research evaluation of an educational program for very young children initiated under the conviction that adult illiteracy might be prevented through intervention into the "cycle of poverty." The method of intervention was to provide a group of preschool children from public assistance families with a training experience which would better prepare them for entry into formal school setting, reduce likelihood of dropping out, and thereby help them to function better on reaching adulthood. A computerized electric typewriter, the Edison Responsive Environment Talking Typewriter, was used to allow the children to move to more complex materials programmed and presented to them after initial familiarization with the keyboard and alphabet at random. The major thrust of the research evaluation was to determine whether this training could positively influence the children's knowledge and skill with respect to verbal fluency, reading ability, and language development. From the evaluation emerged the chief finding that very young children from poor families can be helped before they enter a formal school experience; in a remarkably short period of exposure, the Talking Typewriter training prepared a group of prekindergarten youngsters for first grade work. Detailed tables of test scores and a bibliography are appended. (RJ)

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COOK COUNTY DEPARTMENT OF PUBLIC AID
David L. Daniel, Director
Chicago, Ill.

PROJECT BREAKTHROUGH;

A Responsive Environment Field Experiment With Pre-School Children From Public Assistance Families

Walter W. Hudson, Director
Research and Statistics

August 1, 1969

PS 009 501

637 (FORM 55)

Cook County Department of Public Aid
318 W. ADAMS STREET, CHICAGO, ILLINOIS 60606
TELEPHONE ANDOVER 3-4004

DAVID L. DANIEL
DIRECTOR

August 26, 1969

Mr. Rudy Frank
Research and Demonstration Division
Community Action Program
Office of Economic Opportunity
1200 - 19th Street, N. W.
Washington, D. C. 20506

Dear Mr. Frank:

I am pleased to submit to you this final report of the research evaluation of Project Breakthrough. I believe that the results of this study clearly justify the investment made by the United States Office of Economic Opportunity to aid a number of poor children in Cook County, Illinois.

This study has shown that the use of the autotelic responsive environment system with very young children of low-income families can materially affect the children's potential for progress and achievement within a formal school setting. The educational gains made by these children may function as a significant stimulus for them to complete an education and become mature and economically independent adults.

The transfer of this project to the Chicago Board of Education as a continuing program affords still further opportunities for youngsters in the Chicago community to benefit from the educational opportunities developed through this system of training.

It has indeed been a rewarding experience and a welcome opportunity for staff members of this Department to participate in such an undertaking. I would hope that this report may serve as a stimulus for other innovative approaches to the elimination of poverty in the United States.

If I or my staff can be of any further service in clarifying any issues in this study, please let me know.

Very truly yours,

David L. Daniel

David L. Daniel
Director

DLD:ms

ACKNOWLEDGMENTS

This is a report on the research evaluation of a training program for pre-school age children whose families received public assistance in Cook County, Illinois. The program, known as Project Breakthrough, was funded by the U.S. Office of Economic Opportunity under contract OEO-1239 dated May 15, 1966.

The training program was initially conceived by the project director, Mr. A. Louis Scott, and was begun under the leadership of the late Mr. Raymond M. Hilliard, former Director of the Cook County Department of Public Aid. Initial design, project planning, and contract negotiations were completed by Mr. Scott, Mr. Daniel W. Behnke, former Assistant Director of the Department, and Mr. Oliver H. Martin, Research Analyst.

Very excellent collaboration was achieved with the Chicago Board of Education through the assistance of Dr. Arthur R. Lehne, Assistant Superintendent in charge of Government Funded Programs; Mrs. Evelyn F. Carlson, Associate Superintendent, Department of Educational Program Planning; Mr. Raphael P. Sullivan, Principal, Westinghouse Vocational School; and Miss Joanne Tracy, Language Arts Consultant and Instructional Coordinator.

Dr. Omar K. Moore, Professor of Social Psychology, University of Pittsburgh, served as chief consultant to Project Breakthrough throughout its development and operation. Mr. Richard Kobler, who co-invented the ERE Talking Typewriter with Dr. Moore, provided consultation in project design and management and in equipment utilization.

An intensive training program for key staff members was provided through the facilities of the Responsive Environments Foundation in Hamden, Connecticut. Through this training Miss Lynn Brandenburg and Mrs. Pamela Jung Bach assumed major responsibility with the director for training new staff and developing program materials which were consistent with the objectives and goals of an autotelic responsive environment system.

Dr. John A. Carpenter, Professor of Psychology, Center of Alcohol Studies, Rutgers - The State University, and Dr. Frederick Glick, Assistant Professor, Department of Statistics, University of Chicago, provided technical consultation to the research staff of the Cook County Department of Public Aid. Dr. Norman Washburne, University of Akron, Ohio provided initial consultation regarding research design issues and selection of measurement instruments.

Mrs. Marie Ogden, Chief Psychologist, Psychological Testing Service within the Department's Welfare Rehabilitation Service and her staff administered and scored all of the standardized tests used in this study. Numerous members of the Project Breakthrough staff assisted on many occasions in the collection of data, and others participated in the design and evaluation of study instruments. Mr. David Mann developed the Reading Elements Achievement Test specially for research use and wrote the initial draft of the second chapter of this report.

Miss Nancy M. Singleton, Research Analyst, wrote Chapter V of this report, and based on the information provided in the initial draft, edited and revised Chapter II. Miss Singleton also assumed major responsibility in the production and organization of the final manuscript. Mr. Alexander G. Bessarab, Mr. Paul F. Hoffman, Mrs. Efrosini P. John, Mrs. Margaret J. Lundquist, and Mr. Broderick E. Reischl, Research Analysts, assisted at various stages of the study with data collection, analysis, review, and editing of the report. Mrs. Mary P. Slack and Miss Janet T. Oswald typed the final report and graciously endured the many revisions which were required.

The above acknowledgments represent a very brief listing of the contributions made by a large number of staff and specialists whose help and guidance made this study possible. I am especially grateful to the project director, Mr. A. Louis Scott, who helped meet the rigorous demands of research control on many occasions.

Walter W. Hudson, Director
Research and Statistics

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CHAPTER I

INTRODUCTION

Project Breakthrough was an educational program for underprivileged children whose families were receiving public assistance in Cook County, Illinois. The project was authorized and funded through a contract dated May 15, 1966 between the United States Office of Economic Opportunity and the Cook County Department of Public Aid.

This educational project had several unusual features. First, the children who took part in the project were both very young and very poor. They were from three to five and one-half years of age and were members of families receiving public assistance from the Cook County Department of Public Aid. Secondly, the project involved the use of very complex and sophisticated equipment as an educational aid. Another innovative feature of Project Breakthrough was the close adherence to an autotelic responsive environment system of education developed by Dr. Omar K. Moore. Perhaps most importantly, this project represented a serious investment, made by a major federal agency and executed on a local level, in the development of a preventive treatment for adult economic dependency that was begun prior to the individual's enrollment in kindergarten.

Background and Theory

For many thousands of Americans, poverty has become a way of life and functions as a cultural system in its own right.

Oscar Lewis has stated that "poverty in modern nations is not only a state of economic deprivation, of disorganization, or of the absence of something. It is also something positive in the sense that it has a structure, a rationale, and defense mechanisms without which the poor could hardly carry on. In short, it is a way of life, remarkably stable and persistent, passed down from generation to generation along family lines."[1] The implications of living within the poverty culture were outlined before Congress by R. Sargent Shriver in March, 1964: "Poverty is a rigid way of life, handed down from generation to generation in a cycle of inadequate education, inadequate homes, inadequate jobs, and stunted ambitions. . . . The communities of the poor generally have the poorest schools, the scarcest opportunities for training."[2]

There can be little doubt that the most influential cultural variable associated with poverty is education. More specifically, it is the lack of education which is probably the most powerful single factor in the maintenance of the poverty culture. Associated with low education are low school achievement, inadequate verbal skills, lack of intellectual stimulation, and lack of motivation to acquire an education.

A review of the research literature demonstrates that low educational attainment, insufficient to meet today's more rigid requirements for employment, is by far the most influential single factor associated with chronic unemployment. Unquestionably, the two most distinguishing characteristics of poor people are that they come from poor families and that they dropped out of school.

---

[1] Oscar Lewis, The Children of Sanchez (New York: Random House, 1961), p. xxiv.

[2] "The War on Poverty", A Congressional Presentation, March 17, 1964. Distributed by the Committee on Poverty, c/o The Peace Corps, Washington, D. C. (Processed.)

In a study of 680 public assistance recipients conducted by the Cook County Department of Public Aid it was found that 87.1 percent of the sample were school dropouts.[1] Another study of 278 mothers who received Aid to Dependent Children assistance showed that 86.4 percent had dropped out of school before high school graduation and that their mean educational attainment was only 8.7 years.[2] As of June 1966, the Illinois Department of Public Aid reported that 87.5 percent of the adults receiving Aid to Families with Dependent Children assistance in Cook County had not been graduated from high school.[3] This problem is not unique to the recipient of Aid to Families with Dependent Children assistance. A 1965 study of 332 applicants for General Assistance showed that 82.8 percent had completed less than a high school education.[4]

The vast majority of these persons do not possess sufficient educational skills to qualify for the upgraded jobs that are available in today's labor market, and it is certain that they will be unable to keep pace with future upgrading if they do not improve their reading and arithmetic skills. The task of helping poor adults, whether or not they receive public assistance, generally falls under the rubric of curative measures or remedial education.

---

[1] Cook County Department of Public Aid, The Blackboard Curtain: A Study to Determine the Literacy Level of Able-Bodied Persons Receiving Public Assistance (Chicago: Science Research Associates, Inc., 1963), p. 29 and Table C-19, p. 131.

[2] Cook County Department of Public Aid, A Study to Determine the Employment Potential of Mothers Receiving Aid to Dependent Children Assistance (Chicago: Cook County Department of Public Aid, 1964), p. 30 and Table F-17, p. 141.

[3] Illinois Department of Public Aid, Division of Research and Statistics, Characteristics of Recipients of the Federally-Aided Public Assistance Programs in Illinois: June, 1966, Table 1a, p. 13.

[4] Cook County Department of Public Aid, Characteristics of General Assistance Applicants: 1965 (Chicago: Cook County Department of Public Aid, 1967), p. 10.

With the current high level of functional illiteracy and poor educational attainment of the poor such remedial efforts must be continued and expanded, but even so, a far more basic problem must also be given serious attention. That is the problem of effecting preventive measures which will help to break the cycle of poverty. More specifically, preventive measures are needed to shore up the very young child's meager start on an educational journey which, if begun in the slums of our cities, will most likely be aborted in those slums before he obtains proficiency in the fundamentals of reading and writing.

The current level of knowledge of human behavior and the educative process leaves little doubt that the most formative years of a person's life are those preceding his fifth birthday. This statement represents a succinct summary of the thinking of many educators and specialists in child psychology. Professor Benjamin Bloom has indicated that environmental influences over the first 17 years of a person's life may account for about 20 IQ points, whereas the first four years account for as much as 10 of those points in measured IQ.[1] Moving ahead to the school years, other researchers have observed that "rarely do children who are successful in school leave prior to graduation" and that "'educational' disability . . . cannot be attributed simply to limited mental endowment."[2] Educational disability is undoubtedly related to a failure to acquire basic reading skills. "The significance of reading cannot be overestimated because all too often the deprived child remains retarded in all other subjects due to his inability to read. . . . The development of reading ability is particularly important for the slow physical learner, for it is the key to overcoming his academic deficiencies and anti-intellectualism."[1]

---

[1] Benjamin S. Bloom, Stability and Change in Human Characteristics (New York: John Wiley & Sons, Inc., 1964), p. 72.

[2] Solomon O. Lichter, et al., The Drop-Outs (New York: Free Press of Glencoe, 1962), p. 2.

In summary of the above thinking from the current literature, it is seen that the child residing within a poverty culture confronts a special environment with its own characteristics. That environment operates as a powerful force in the formative years of his life. The privations and hardships of that environment leave the child ill-prepared for the task of confronting the intellectual challenge and labor of a formal education. His low level of preparedness for schooling is revealed through the difficulty he encounters in learning to read and keep pace with his more advantaged counterparts. Failures in the early school years cumulate, and by the time the youngster reaches the end of his elementary school years, he may be "primed" for an avoidance reaction to the school system.[2] He may withdraw from school both emotionally and intellectually long before he is actually classified as a dropout. Once this chain is established, the road ahead may lead to adult dependency, chronic unemployment or at best a series of jobs with low wages, and another replication of the cycle of poverty.

The Project Objectives

Basically, the long-range goal of Project Breakthrough was to prevent the child from becoming a high school dropout by providing him with a training experience which would help to overcome some of the privations in his early environment in relation to the development of verbal and language skills. By providing a training program which, it was hoped, would serve to intervene between the child and the effects of a poverty environment, a very important link in the poverty chain might be weakened if not broken. If the impact of the environment in the child's early formative years is great, any success in modifying a portion of that environment should result in a measurable change in the child's performance over a relatively short period of time. Also, following the lead of the theoretical outline presented above, it was felt that gains in the child's understanding of basic reading and language skills at the pre-school level would have a more enduring effect than a remedial program administered at a later age.

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[1] Frank Riessman, The Culturally Deprived Child (New York: Harper & Row, 1962), pp. 115-16.

[2] Lichter, The Drop-Outs, p. 2.

Clear recognition was given to the fact that deficiencies in intellectual stimulation, language development, and verbal fluency in the early years are but a single area of privations which constitute the poverty environment of the children. In addition, the father is frequently absent from the home, the mother has a poor educational history herself, the family may reside in a slum neighborhood, and the structure which houses the family may be deteriorated or dilapidated. While reported attitudes toward obtaining an education may seem quite positive, many of the adults around the child may feel defeated in relation to their own educational achievements and express little genuine interest in the available educational facilities. In short, a training program alone cannot be expected to overcome all or even most of the debilitating factors which characterize a poverty environment.

A second major objective of the project was, therefore, to provide the families of the children with a body of social services which would form another mode of intervention in the poverty environment. It was hoped that by giving more social work services to the families some of the attitudes and feelings of despair in regard to the training goals could be ameliorated. Some families would be in need of special help to secure better housing, or to obtain supplementary assistance grants for special needs, such as clothing, carfare, and health services. It was anticipated that some of the mothers would raise questions about, what seemed to them, evidence of slow progress by their child in the project. If this occurred, the mother might be inclined to remove the child officially or simply stop sending him to the project site. Also, it was thought that some children might, at the beginning of the study, display some initial fear of participation and that the caseworker might be of help to the mothers in understanding and resolving the children's fears and anxieties. Thus, a variety of social services might prove beneficial in terms of the children's continued participation in the project and helping the family unit with real social problems within a poverty environment.

In summary, the primary objective of Project Breakthrough was to raise the skill level of pre-school children in public aid families in the area of reading and language development. This was to be achieved by providing both a special educational program to the children and an array of social services to their families. In this sense, the two major objectives can be seen as but two parts of an integrated effort to modify a few of the important elements comprising the poverty environment.

Edison Responsive Environment Training

The training program provided to the children represented a dual innovation. First, the training system itself was based upon the work of Dr. Omar K. Moore who developed the theoretical concepts he describes as an "autotelic responsive environment."

> For a number of years my staff and I have been conducting studies of early learning in pre-nursery, nursery, kindergarten and first grades, where children are in the process of acquiring complex symbolic skills. In the course of this work I formulated the notion of a responsive environment . . . and decided to act on the assumption that an autotelic responsive environment is optimal for acquiring such skills. I will now try to make clear just what this assumption means.
>
> I have defined a responsive environment as one which satisfies the following conditions:
>
> (1) It permits the learner to explore freely.
>
> (2) It informs the learner immediately about the consequences of his actions.
>
> (3) It is self-pacing, i.e., events happen within the environment at a rate determined by the learner.
>
> (4) It permits the learner to make full use of his capacity for discovering relations of various kinds.
>
> (5) Its structure is such that the learner is likely to make a series of interconnected discoveries about the physical, cultural or social world.[1]

The above system of training, as described by Dr. Moore, is contrasted with the more traditional form of didactic instruction. In the latter, the teacher, leader, or instructor gives or withholds both positive and negative reinforcements and assumes an active role in the educative process by directing and controlling the progress and content of the learning situation.

The major components of the responsive environment were presented to the children in this project through the use of the Edison Responsive Environment Talking Typewriter, manufactured by the Thomas A. Edison Laboratories of the McGraw-Edison Company, West Orange, New Jersey. The equipment was obtained through the Responsive Environments Corporation in New York City, which served as the marketing agency for the McGraw-Edison Company.

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[1] Omar Khayyam Moore, Autotelic Responsive Environments and Exceptional Children (Hamden, Conn.: Responsive Environments Foundation, Inc., 1963), p. 2.

The "Talking Typewriter" is a computerized electric typewriter which allows the child to proceed at his own pace while exploring areas of his own interest. The child familiarizes himself with the alphabet, first by pressing keys one at a time on the keyboard at random. Instantly, a recorded voice sounds the name of the letter as it appears in large type on paper in front of the child. From this initial exploration of the keyboard and alphabet, the child moves forward to more complex materials which are programmed on the computer and presented to him.

Intensive Social Work Services

During the early planning stages of Project Breakthrough it was decided that caseworkers assigned to this experiment should possess a minimum of a master's degree from an accredited school of social work. The fundamental definition of "intensive" social work services in this study was to be the provision of services by professionally trained workers. Recruitment efforts quickly revealed, however, that graduate social workers simply were not available for assignment to Project Breakthrough from within the Cook County Department of Public Aid. At that point it was necessary to move quickly as the project had to get under way. Given the necessity of relying upon bachelor-degree caseworkers, an alternate definition of intensive services had to be developed.

Intensive social work services, for the purpose of this study, were therefore defined in quantitative rather than qualitative terms. That is, an effort was made to provide more of the available social work skills and services rather than to raise the skill level of the workers. The project director, Mr. A. Louis Scott, began recruiting workers from the Department's casework staff of about 1200 workers, and four persons were finally selected to participate in the intensive service units.

Normally, each caseworker with the Cook County Department of Public Aid has a caseload of about 60 families (or an equivalent number of family and single-person cases). However, the four workers assigned to the intensive service section of Project Breakthrough were given a reduced caseload of only 30 families each in order that they might conduct more home visits and telephone contacts and devote more time to helping each family with problems which might arise.

The Research Problem

Succinctly stated, the major research problem consisted of a dual evaluation which would determine whether the Edison Responsive Environment (ERE) training and the provision of intensive social work services could positively influence the children's knowledge and skill with respect to verbal fluency, reading ability, and language development. While this statement describes the major thrust of the research evaluation, a number of other relevant questions were also examined.

As a public social welfare agency, the Cook County Department of Public Aid wished to learn more about the possible deficiencies in language skills of very young children whose families receive public assistance. The Department also wanted to determine whether the provision of services through reduced caseloads could be shown to have a positive effect upon the performance of the children within the training program. This in no way implies that failure to show positive effects in relation to the training progress of the children will constitute an evaluation of the total merits of social work services. It is quite possible that social work can and did function as a valuable aid to the families in coping with a variety of problems which were not brought under scrutiny in this study. Thus, the effect of social work services is being measured within a very narrow and highly specified domain: its contribution to educative gains of young children over a period of about nine months.

Another problem area brought under investigation within this study was the potential impact of functional behavior patterns within the families upon the performance of the children. The major research question to be answered through this portion of the investigation is whether children from highly dysfunctional families show poorer performance in the project than the children from families rated as having a higher level of family functioning capacity. In order to obtain measures of "family functioning capacity", it was necessary to develop a special rating scale for this purpose. The rating scale, called the "Family Functioning Instrument", is described in detail in later sections of this report.

A subsidiary issue brought under investigation in this study was the notion of "independence" of the experimental treatments. That is, were the effects of ERE training operating independently of the effects of intensive social work services, or did these two variables seem to depend upon one another. It may seem at first that special training effects obviously do not depend upon whether the children and their families receive social work services. Children do receive an education every day in the formal school systems and they, for the most part, do not get social work services; under these circumstances they do grow and learn. How then can it be argued that learning can be dependent upon the presence of social work services? Previously, a case was made for the existence of a special poverty culture or environment which affects the intellectual growth of children who live within such a culture. Certainly, learning is not wholly dependent upon the provision of social work services, but the provision of such services might so modify the children's capacity to profit from an educational experience that a relationship between the effects of training and social work services may be demonstrated.

While the foregoing pages describe the major issues of the study, they are summarized below with a listing of some of the secondary research questions.

1. Did the provision of ERE training produce a positive influence upon the verbal fluency, reading skills and language development of the children?
2. Did the provision of intensive social work services produce a positive influence upon the verbal fluency, reading skills and language development of the children?
3. Did ERE training positively influence the verbal fluency, reading skills and language development of the children independently of the provision of intensive social work services?
4. Were measured differences in the level of family functioning capacity related to the ability of the children to perform in the project?
5. Is there any evidence in this study to support the notion that a poverty environment or culture affects the reading, verbal and language development of the children?
6. Were intensive social work services effective in reducing the number of project withdrawals and the rate of absences?
7. Did intensive social work services or ERE training positively influence the children in terms of growth in social maturity?
8. Did intensive social work services or ERE training have an influence upon the families' functioning capacity?

Research Hypotheses

Frequently, the research objective is one of determining whether there are differences between two or more groups of study participants with respect to some specified measure. For the purposes of this study, it was felt that such a question would not fulfill the purposes of the investigation. In short, interest was focused only on the prediction that children with ERE training would do better than those who received no training, and that children who received intensive social work services would do better than those who received only the regular social work services.

At the beginning of the experiment very explicit directional predictions were made with respect to the results of the study. If these predictions were made before the study was begun and the findings at the end of the study coincide with the predictions, there is reason to believe that the training did in fact have the effect upon reading and language development which was anticipated. Therefore, the important research questions have been re-stated below in testable hypothesis form:

1. The children who received Edison Responsive Environment training (ERE) would, at the end of the project, demonstrate higher performance ratings on a variety of criterion measures than a group of similar children who received no training;
2. The children whose families received intensive social work services would, at the end of the project, demonstrate higher performance ratings on a variety of criterion measures than a group of similar children whose families received only the regular social work services;
3. The children receiving intensive social work services and ERE training would obtain higher performance ratings than those children receiving only regular social work services and no training; and

4. The children who came from families with higher levels of family functioning capacity would achieve higher performance ratings at the end of the project than a group of similar children who came from families with lower levels of family functioning.

CHAPTER II

DESCRIPTION OF THE PROJECT

The material presented in this chapter provides a description of the physical layout of the project site, the daily routine of the children, the various learning experiences offered to the children, and the personnel who were in charge of the project. The reader will see in this chapter that the daily operation of Project Breakthrough was guided by the aims and purposes of the total program. On the other hand, while the project operation was highly structured from a theoretical point of view, the program tasks were executed in a manner which placed minimum constraint upon the behavior of the children.

The Layout of the Project Site

Project Breakthrough was located on the first floor of a four-story building on the west side of Chicago, approximately five miles from the city's central business and shopping district (Appendix I, Exhibit 1). Previously a candy factory, the building was remodeled as a center for job training and adult literacy classes of the Cook County Department of Public Aid and vocational classes of the Chicago Board of Education.

In addition to locker and administrative space, the project site had three main areas. One of these was the nursery which was equipped with furniture and toys tailored to the pre-school child. In one part of the nursery was a playhouse, containing a toy-sized kitchen with a dining table and chairs. Another nursery section was a library area where several shelves of children's books were within each child's reach.

Special care was taken in designing exhibits for the nursery's bulletin boards and wall displays, in order to present both familiar and new materials to the children. Some of the display themes included balanced meals, street safety, how to tell time, seasonal and holiday subjects, and personal care and cleanliness. Through these displays an effort was made to present self-care and socialization concepts which may not have been learned in the home or which needed reinforcement.

Another main area of the project site was the room or "laboratory" in which the ten Edison Responsive Environment (ERE) Talking Typewriters were located. Each of these computer-based learning devices was enclosed in a large, well-lighted and sound-proofed booth, thereby ensuring privacy to its occupant. One-way viewing screens located in the walls and doors of each booth and a two-way communication system between the booth and the outside control panel provided constant visual and auditory contact with the child.

The Talking Typewriter has a keyboard closely resembling that of a standard electric typewriter, and its characters are the same (Appendix I, Exhibit 3). The main difference is that the keys on the Talking Typewriter are divided into eight color groups, corresponding to the finger positions in touch typing. A clear lucite cover houses all parts of the Talking Typewriter that instruct the child or show him what he has done. The child can see what is going on, yet inquisitive fingers are kept away from the typewriter's moving parts. A microphone is contained within the lucite cover to transmit the child's voice to the control panel outside the booth or to a receiver within the Talking Typewriter where the child's responses to questions are recorded. Beneath the lucite cover, a continuous roll of paper is fed through the typewriter's platen. Behind this is the program letter exhibitor and to its left is a rear-image projector screen. An encoding panel is located on the side of the machine.

The third area of the project site was a small room which was furnished with table and chairs and reserved for small-group activities. It was here that the "transfer sessions," to be described later, took place.

The Daily Routine

The most distant neighborhood served by Project Breakthrough was approximately three and a half miles from the project site (Appendix I, Exhibit 2). The children lived about two miles away, on the average. Four groups of children attended the project each day, and these groups were determined by the geographical area in which the children lived. A bus transported the children from a central location near their homes to the project site. An attendant made certain each child was properly seated with his seat belt fastened. For many of the four-year-olds, the busing experience may well have been their first trip away from home.

When the children reached the Breakthrough location, attendance was taken. The children then went to their individual lockers to hang up their hats and coats. Each child's locker had his name and his picture on the door. Once their garments were put away, the children proceeded to a table near the nursery entrance where their fingernails were painted with non-toxic water colors, to correspond with the color groups on the Talking Typewriter keyboard mentioned earlier. The children then went into the nursery area. The final part of each daily session was also spent in the nursery, from which the children would return to their lockers, don hats and coats, and board the waiting bus for the trip home. Each group of children spent approximately one and a half hours daily at the project site.

The Learning Process

While the learning process of Project Breakthrough hopefully began when the children boarded the bus, this section describes the activities in the nursery, laboratory, and transfer room settings at the project site.

Nursery Activities

Throughout the entire project period, each daily session began and ended in the nursery area. The first ten or fifteen minutes of each session was a free play period for the children. At the end of each session, the nursery teacher guided the group in a conversation period before they returned to their lockers and headed for the bus. These open-ended conversation periods gave the children further experience in communication and social skills. During these discussions the nursery teacher was able to learn individual interests and home experiences that could be added to the program content of ERE activities.

For the first week or two, the children remained in the nursery area. For the first few days the children explored their surroundings and engaged in whatever activity they chose without interruption. Nursery and laboratory personnel observed the children during this introductory period in order to become familiar with them. The staff only observed the children and did not become directly involved with them at this time.

After a few days, the nursery personnel guided the children from their free play activities into more structured learning experiences. They were invited to sit around the record player to hear a song or listen to a story. The children were eventually guided into small-group activities involving only four or five children and a nursery teacher or aide. While previously the children had complete freedom of time and undertaking, they now engaged in an activity planned for them by someone else. They no longer had the freedom to initiate or terminate the activity as they had in free play periods. The purpose of the small-group activity at this time was to prepare the children for their forthcoming learning experiences in the laboratory.

As time progressed, the nursery period was divided into three parts: self-selected, small-group, and total-group activities. Each segment of nursery time was about twenty minutes in length. The children left the nursery to take part in laboratory or transfer sessions and resumed nursery activity upon their return.

Introduction to the Talking Typewriter

The first project enrollees were introduced to the ERE Talking Typewriter and the booth area by laboratory personnel. As more enrollees entered the project, however, the children who were experienced in using the Talking Typewriter became tour guides, each taking a new student by the hand from the nursery to the laboratory and from one booth to another. The tours usually lasted for about twenty minutes. The booth attendants remained as much in the background as possible, to show the children that the booth area was theirs and would respond to them as they required.

Generally, the children had their first session with the Talking Typewriter the day following their introductory tour, some time during the second or third week of enrollment. As they entered the booth, the children were told that, like the books and other playthings in the nursery, the machine also was their toy and that they could play with it as they wished. From outside the booth the booth attendant observed each child; if he played with the machine's microphone or encoding panel, the attendant simply said through the intercom, "My toy."

ERE Non-Automated Session

During the initial sessions, the machine was in a non-automated phase and under the child's control, except for the carriage return which automatically returned when the last character on a line was typed. The keyboard was left totally unlocked. Investigating each key and other machine parts, the children explored the typewriter just as they had initially explored the nursery. During this time their key depression pattern was usually random. The children were usually unaware of the machine's pronunciation of the character name of the key they had struck. Careful records of time and stroke count were kept, since these were significant indicators of the child's activity and learning development, especially during his early sessions. As each child became more familiar with the Talking Typewriter during the initial random exploration period, he gradually began to exhibit a pattern in key depression. He would progress from key to key horizontally across each row; he would go from top to bottom in column fashion; or he would depress all of one color group's keys and then move on to another color group. This phase of development is called "systematic exploration" and is considered to be a significant step in familiarization with the Talking Typewriter.

As the child became more familiar with the machine, he became aware of what happened when he depressed a key. For some of the children, key depression meant that an impression was made on the paper roll; for most, however, it was linked to the machine's voice: the pronunciation of each character name immediately following key depression. The first indication of this awareness occurred when the child depressed the same key twice or more in succession. This demonstrated that the child was listening to what the machine said after he had struck the key and was an important step in learning the association between a character's name and shape.

While listening to the key voice, the child usually looked at the key he was striking. It was interesting to note the child's increasing fascination with the sound and name of each key. During this phase of study, it was common for a child to strike the same key as many as fifty times in succession. A simultaneous increase in the time spent in the booth and decrease in stroke count indicated that the child was allowing more time between key depressions and devoting more attention to each depressed key and its accompanying sound. When he had reached this stage, the child was ready to learn to read. He had by this time begun associating letter shapes with their names and was usually capable of distinguishing between the shapes and names of several letters.

At this stage the booth attendant began entering the booth with the child. Using upper-case, plastic letters with built-in magnets, the attendant introduced the letters by telling the child that these were more of "his toys." She showed the letter to the child, pronounced the letter's name, and then placed it on the Talking Typewriter above the keyboard. The attendant would then sit back quietly while the child searched for and typed the letter. The attendant from time to time repeated the letter name but said *nothing more.*

After the child had typed the letter and the machine's voice had followed, the booth attendant pronounced the letter name, pointed to the magnetic letter, and repeated its name. Then she immediately repeated the letter name and pointed to the printed impression on the paper roll, again saying the name. This entire process could be repeated one or two more times before the next magnetic letter was presented. This procedure of instruction during a non-automated session continued until the child was able to locate quickly and type the letter when a magnetic letter or flashcard letter was presented to him. At this stage the child was said to be able to recognize letter shapes and names.

ERE Automated Session

The switch from non-automated to automated instruction sessions was decided by the booth attendant and her laboratory supervisors. Their decision was based upon the ratio of stroke count to session time and their observation of the amount of time required by the child to locate keys. When, according to these two criteria, the child had demonstrated his familiarity with the keyboard, he progressed to the automated session.

In the automated session, all instructional stimuli came from the Talking Typewriter. Its computer was programmed before the child entered the booth; when the booth door was closed and the controls were set, the computer activated the session. With the typewriter carriage appropriately located for the particular type of program, the illumination of the letter exhibitor marked the start of the session. All instructions to the child were issued by the machine's recorded voice. The child could respond in any way he wished and could strike any key he desired. However, the entire keyboard was locked, except for the one correct key which could be depressed. When the appropriate key was struck, the letter was printed on the paper roll. The letter exhibitor would then display the next letter on the program card, and the machine's voice would instruct the child to depress the new key.

In this way, a new stimulus was presented to the child following his correct response to the preceding one. The child thus was able to proceed at his own pace. He was under no pressure to perform at a pre-determined rate and could terminate the session at any time he wished. When working with programmed material, some children would occasionally say that they "just wanted to type." This indicated that they had become uncomfortable with the challenge of programmed material and wanted to spend the remaining time playing with the keyboard. They were permitted to do this, as it maintained their interest in the Talking Typewriter.

The child's interest in program content was stimulated by the constant presentation of subtle challenges to his curiosity and skill.

For example, when instructing the child to depress a certain letter, the visual cue would perhaps be given without an accompanying auditory cue, or vice versa. Programs were often printed on multi-colored cards. Sometimes the letter exhibitor would move several spaces between letters, or it would exhibit letters in a random sequence. To individualize program content, a family event or favorite television show which the child had mentioned during small-group activities would be interwoven as a theme in the automated session.

Transfer Session

Another learning situation encountered in Project Breakthrough was the transfer session. These sessions took place in a small room which was separated from the nursery and laboratory areas. With two, three, or four other children and a booth attendant, the child participated in games and exercises involving letter-finding, shape and sound discrimination, and word construction. While the ERE process provided learning experiences in a secluded atmosphere, the transfer session allowed the child to compete with others in learning situations. Through discussion and games, the transfer session aided the child in relating his learning experiences in the ERE booth both to his home and community environment and hopefully to future school-related activities involving the use of paper and pencil.

Variations in the Learning Process

Daily staff meetings were held to evaluate each child's progress and activities. Based on the staff evaluations of the child's performance, a schedule of activities was devised to provide an opportunity for the most achievement by the child. The tentative schedule would be made up a week or more in advance, with modifications incorporated as the result of daily staff conferences. Once the child became accustomed to automated sessions, his ERE activities were thereafter varied. As a general rule, each child was given one transfer session and one non-automated session each week. The remainder of his time was devoted to automated sessions. By varying the kinds of activity, the child was less likely to become bored with the learning process. He also had the opportunity to reinforce what he had learned in automated instruction by participating in non-automated and transfer sessions.

At some time during his nursery activity, the child would be invited to go "play" in the laboratory: the booth attendant simply called the child by his name and motioned to him. At this time the child had no idea of the kind of activity planned for him, whether it was an automated, non-automated, or transfer session. If he chose, he could refuse to leave the nursery activity and thus would continue whatever he was doing. Occasionally, a child would be approached a second time, but for the most part, the booth attendant made a note of his refusal and did not ask him again until the next day. A repeated invitation was usually offered to the child who had exhibited a long period of refusals.

Project Staff

There were 32 members of the project staff assigned to five different areas: administrative, laboratory, nursery, social work, and ERE maintenance. The administrative staff responsible for the overall administration and coordination of the project included the director, the assistant to the director, project secretary, records technician, and project coordinator. A laboratory supervisor, assistant supervisor, and seven booth attendants made up the laboratory staff. A supervisor, teacher, and two full-time aides were in charge of the nursery. In addition, there were six part-time nursery aides and a bus attendant who supervised the children enroute between the project site and their bus stop location. The social work staff consisted of a supervising caseworker, four caseworkers, and a community representative. These staff members worked only with the families in both the experimental and control groups who received intensive casework services.

The staff had to relate easily and quickly to young children. The nursery and laboratory staff also had to be innovative and capable of creating new program material and lesson plans which would constantly stimulate and challenge the children and effectively fulfill the instructional goal. With only two exceptions, none of the staff hired for Project Breakthrough had previous teaching experience. Prior teaching experience was avoided since the transition from traditional instructional methods to the autotelic orientation and procedures of the project could cause difficulties. This was especially true in the booth area where the booth personnel functioned solely as technicians. Prior experience in more directive instruction might have hindered the experienced teacher in accepting the role of technician.

Before project operations could begin, several staff members had to be trained. As this type of project had been non-existent in the Chicago area, the laboratory supervisor, assistant supervisor, and project coordinator went to the Responsive Environments Foundation in Hamden, Connecticut for a five-week training period. There they were instructed in the operation of an autotelic learning environment and received practical training in techniques and procedures. They learned what type of physical set-up was required, what equipment and material were needed, and where flexibility within the autotelic methodology could be used to meet the needs of the individual child.

As the first Talking Typewriters were delivered and set up, additional laboratory personnel were hired and trained by the staff members who had been to Hamden. The Chicago training of staff members had several phases. During the first week, new personnel were introduced to the responsive environment methodology and were trained in procedures relating to the Talking Typewriter. For the next two or three weeks, they were given intensive instruction in conducting automated and non-automated sessions and in creating and encoding programs. Approximately two months after they had begun their initial ERE instruction, the laboratory personnel learned how to conduct transfer sessions.

The caseworkers received no special training for their project work, other than one or two days' exposure to the responsive environment methodology and practices. That brief exposure was found to be sufficient to enable the caseworkers serving experimental group families to explain a child's progress, or lack thereof, to his parents.

The casework staff was supplemented by a community representative, who had been a public aid recipient herself. The community representative visited the homes of children enrolled in the project to evaluate the parents' reaction to their child's participation in the program. The representative's greatest value was seen in her working with those cases where possible problems in the home were reflected in the children's behavior at the project site, i.e., frequent refusals or absences, withdrawing behavior, or other problems. The community representative was able to relate to the parents on a peer basis. Her reports thus provided valuable assistance to the caseworkers and the project personnel in working with the children and their families.

The project staff also included one ERE service technician who was an employee of the Thomas A. Edison Laboratories, Inc. While the typewriter and its encoding components are relatively durable, the connected computer is not. The service provided by the technician assured the uninterrupted operation of the project. The amount of time during which any of the ten Talking Typewriters was out of service was negligible.

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

Within this chapter the study methodology will be described in detail, including the research design, construction of the experimental and control groups, description of the study instruments, data collection, measurement techniques, and methods of analysis. A number of special problems arose in the measurement of certain variables, and it is therefore necessary to discuss the theory, reliability, and validity of some of the measurement devices which were used. Practical considerations in the administration of Project Breakthrough required deviation from the original research proposal, and this chapter will contain discussions of such deviations.

Design of the Study

The design of this research evaluation was based upon the classical laboratory technique of comparing one group of students who received training with another group who received no training. Those who received training were regarded as the experimental group and those who received no training were regarded as the control group. Through comparison of these groups in their performance on a test, such as a reading readiness or intelligence test, the researcher was able to conclude that better performance by students in the experimental group was due to the training that was given.

In order for the researcher to conclude that the better performance by the experimental group was in fact due to the effect of the training, he had to be reasonably sure that some other factor, such as differences in the parents' education, was not responsible for the performance gains by the experimental students. Such extraneous factors were accounted for and these will be discussed in more detail. It is useful to point out here, however, that three general types of variables were identified. The first was the training variable which was experimentally manipulated by giving training to some students and withholding it from others. Variables which were manipulated in this manner were regarded as "independent" variables.

The second general type of variable in this study was the performance measures, such as the intelligence or reading readiness test scores. Since these measures were used as the primary tools of evaluation, they were regarded as "criterion" variables.

Extraneous factors, such as differences in the parents' education, did not function as criterion variables because they were not used to evaluate performance in the experiment. Neither did they function as independent variables because they were not manipulated by the researcher. However, since they could have destroyed the effectiveness of the research experiment, they were controlled, eliminated, or accounted for. They served as "control" variables and constituted the third class of variables dealt with in this study.

As indicated in Chapter I, this study was designed to determine whether training with the use of the Edison Responsive Environment (ERE) Talking Typewriter would have an appreciable effect in increasing the reading and language skills of pre-school age children on public aid, and whether intensive social work services would enable the children to better utilize the training opportunity provided by Project Breakthrough. The training exposure therefore functioned as one independent variable, and the social work treatment functioned as a second independent variable.

In order to utilize the experimental vs. control group research design outlined above, it was necessary to use two experimental and two control groups. Both experimental groups received ERE training while the two control groups received no ERE training. One experimental group and its matched control group were given intensive social work services. The remaining two groups received the normal complement of social work services given to any family receiving public assistance through the Cook County Department of Public Aid.

Another concept must be introduced as it forms an important part of the design of the study. It is referred to as the interactive effect of the two independent variables, or simply interaction. It was quite possible that the ERE training alone would account for any observed improvement in the performance of the experimental group over the control group. It was also possible that the ERE training would produce some performance gains, but when combined with the provision of intensive social work services, it would produce even greater performance gains. If this latter possibility were found to be true, the two independent variables would be said to interact. It was important to evaluate such interactive potentials, and this was done through a special arrangement and treatment of the two experimental and the two control groups discussed above.

The special arrangement of the four groups of students required that:

Group I	receive intensive social work services and ERE training;
Group II	receive intensive social work services but no ERE training;
Group III	receive regular social work services and ERE training; and
Group IV	receive regular social work services but no ERE training.

The arrangement of the four groups of students according to the different treatments they received in both training and social work services is diagrammed below. Thus, the design of this study can be succinctly described as a four-celled, experimental vs. control group, factorial research design. In the analysis portions of this report, the cell numbers in the diagram will identify the above four groups of students. The terms "cell" and "group" will be used interchangeably.

	Social Work Treatment	
Training Exposure	Intensive Casework Services	Regular Casework Services
ERE Training	I	III
No ERE Training	II	IV

Under the field conditions encountered in this project it was not possible to adhere to the principle of random assignment, and a mixed procedure of matching and random assignment was used to form the four study groups. In order to establish that homogeneous and therefore comparable groups were used in the study, the groups were compared through statistical tests on a wide variety of control variables. The results of these tests are reported in later chapters, and the details of the study groups' construction are reported below.

Construction of Experimental and Control Groups

The nature of the project and practical considerations prescribed that participants would be pre-school age children in poor families residing in a geographic area approximately five miles in radius from the training center, thereby curtailing both travel time and the number of bus stops. More precisely, candidates were to be:

1. 3.5 through 4.5 years of age at the time of enrollment into the project;

2. Members of families receiving public assistance; and
3. Residents of the inner-city area served by two of the Cook County Department of Public Aid's district offices -- Garfield and Madison -- and three of its housing project offices -- Henry Horner, Jane Addams and Cabrini.

The public aid requirement and the geographic locale held true for all members of the final research sample, but the age range was slightly extended because of recruitment difficulties. In order to identify possible participants, the Illinois Department of Public Aid supplied listings of all families served by the five offices who had one or more children in the appropriate age range. Letters were then sent to the families inviting them to attend a meeting where Project Breakthrough was explained and their participation sought (Appendix II, Exhibit 1). Where the mailed invitations drew no response, recruitment efforts were extended through follow-up letters (Appendix II, Exhibit 2) and home visits by caseworkers. A less formal technique, word of mouth, also attracted interested families who had heard about the project from neighbors.

Those families who agreed to take part in Project Breakthrough were referred to the Psychological Testing Service within the Welfare Rehabilitation Service of the Cook County Department of Public Aid. There, each child was given the Stanford-Binet Intelligence Scale (Form L-M), and the parent was given the Stanford Achievement Test, Form W, Intermediate I, Reading Tests. In addition, the Vineland Social Maturity Scale was completed on the basis of information supplied by the parent. Concomitantly, caseworkers were submitting social characteristic information for the participating families.[1]

Once test scores had been determined, assignments were made to research groups. Because the intensive caseworkers only served families involved in the project, it was necessary to develop their service loads as quickly as possible. Thus, initial participants were assigned to the intensive casework staff. The children were matched within plus or minus two IQ points on the basis of their performance on the Stanford-Binet Intelligence Scale.[1] Also, consideration was given to the approximate matching of dates of entry into the project. This was important, so that children undergoing ERE training could be compared with children without such training over a similar period of normal maturation. The paired IQ scores were ranked from high to low, on the basis of the lower score within each pair. A random draw determined the starting point for assignment; that is, whether the lower or higher partner within the lowest or highest pair would be assigned to the experimental-intensive group (I) or the control-intensive group (II). Once the initial draw was made, the remaining partner in this first selected pair was placed in the opposite group. The placement of the second pair was determined by reversing all conditions specified by the random draw. For example, by random draw the higher partner within the highest pair would be assigned to experimental Group I. The lower partner within the same highest pair would enter Group II. The next placement would involve the assignment of the lower partner within the lowest pair to experimental Group I; his higher partner would join Group II. The third selection would lodge the higher partner of the second highest pair in Group I. This alternate matching scheme continued until the two intensive groups were complete.

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[1] This instrument will be described in a later section.

As additional children entered the program, the same matching technique was employed for assignment to the two groups (III and IV) within the regular casework unit. Although matching was done within each casework service framework, there were no significant differences found among the four groups according to IQ scores.

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[1] An exception is noted for one pair which was matched with a four point difference.

Screening, recruitment, testing, and formal entry into the research project were carried out over a period of several months.

In addition to expansion of the age range, the final research sample differed from that initially proposed in several ways. One deviation was size. The original research proposal called for the inclusion of 300 children, with 75 in each of the four cells. Early administrative experience indicated that such a goal was clearly unrealistic. It had to be modified because of recruitment difficulties and the lack of available staff to recruit, collect information, and conduct testing, in addition to carrying out other responsibilities. There also appeared to be a scarcity of potentially eligible children residing in the target areas, perhaps because of competition from other community programs that were also being developed for them. Extension of the geographical boundaries would have created difficulties in organizing bus transportation for such very young children over long distances and may have necessitated decentralization of the project, prompting further delay and more administrative headaches.

Once these considerations were set into realistic perspective, the project director and the research staff agreed to a reduction of the research sample to 200 children and a slight expansion of the age range. Upon termination of the research project on August 15, 1967, a total of 184 children had been involved in the research component of the project. However, some of the 184 students dropped out of the program, and for others, test information was incomplete. In such cases, the corresponding partner within the matched pair also had to be excluded. Consequently, the final research sample consisted of 136 children, 34 in each of the four cells.

Several other changes in plans were made. Initially, all children were accepted, regardless of their performance on the intelligence test. However, experience showed that children with very low scores were demanding an inordinate amount of time from the project staff. At the request of the project director, a cut-off score was adopted for children referred to the project site. As of November 21, 1966, only those children who received an IQ score of 65 or higher were referred to the project. While a matter of concern to the administrative staff, the imposition of this screening criterion would appear to have minimal effect on the research phase: up to that time only three children entering the project had scores below 65.

While the restriction on IQ scores was imposed, another was lifted. Initially, only children whose parents were found to be functionally illiterate, that is, who tested below the fifth grade level on a reading achievement test, were to be selected. This requirement was abandoned as of November 7, 1966, because it placed too great a restriction on the number of children within the project area who would be eligible for inclusion.

Consequently, the final research sample consisted of 136 preschoolers. Among those receiving intensive casework services, each child exposed to the ERE experience had a control counterpart whose IQ score was within two points of his own. A similar claim could be made for each child in the experimental group receiving regular casework services.

As the screening experience indicates, it was not feasible to institute other controls without having access to multitudes of potential participants and a greatly increased staff to recruit and test them. On the other hand, other considerations are quite relevant to the research objectives. Thus, while the parents' reading level, the age of the child, prior exposure to nursery school or Headstart, and a host of other factors could not be taken into account at the time of screening and selection, they will all be considered in following chapters where assessments of homogeneity have been reported.

Study Instruments

It was necessary to select and construct a variety of research instruments for the collection of data. One of the most persistent problems encountered throughout the operation of the project was disagreement in regard to the adequacy and appropriateness of some of the instruments. Project Breakthrough has stimulated interest among many agencies and individuals with recognized expertise in the fields of education, psychology, and language development. Some consultants felt that use of the Stanford-Binet Intelligence Scale was totally inappropriate and a waste of time -- especially with such young children as those in the project. Others agreed that it would prove a useful instrument, but felt that it was "less than best."

Other points of dissension were repeatedly expressed in regard to any assessment of "reading readiness." There were some advisers who felt there was really no such thing as reading readiness, and any measurement of those variables associated with the concept would in truth be the measure of a variable-mix of elements associated with maturation, intelligence, and perceptual acuity. Others agreed in part, but felt that the reading readiness concept could not be entirely abandoned. A third group was, of course, decidedly in support of the notion of reading readiness and felt that factors comprising such a skill system were capable of measurement.

Out of the dialogue that preceded the selection of standardized tests and which followed criticism of their use came a notable point of consensus. No one seemed certain enough of the instruments currently on the market to advise the research or project staff in regard to a "best" test of reading readiness or reading ability for children of this age. All agreed that experimentation and test construction in the field of language study and development for preschool age children were not very far advanced. The terminal point in such dialogue clearly indicated that the research staff was charged with the task of selecting the best of the available devices for working with these children.

Stanford-Binet Intelligence Scale

Some measure of intelligence was deemed necessary from the beginning, at least as a control variable in a research evaluation of the project. This was a central concern since serious mismatches in intelligence could render a fair evaluation an almost hopeless task. Initial plans for Project Breakthrough included the use of a private or independent testing facility, but the difficulty of securing such services over a long period of time for fees compatible with the project budget prevented this. Consequently, administration of standardized tests fell upon the Psychological Testing Service at the Welfare Rehabilitation Service of the Cook County Department of Public Aid. Selection of the Stanford-Binet Intelligence Scale, Form L-M, was made primarily on the basis of discussions with Dr. Moore, members of the Advisory Board of Project Breakthrough, and Mrs. Marie Ogden, chief psychologist at the Psychological Testing Service.

Peabody Picture Vocabulary Test

This test was selected for use as a second measure of intelligence at the end of the project. As scores were being reported at the end of the project for the Stanford-Binet Intelligence Scale, the Office of Economic Opportunity was then in need of an immediate program report -- even if only as a preliminary statement. Examination of partial test results at that time suggested that the Binet test lacked measurement sensitivity with these children, or that the project had failed. In light of this, it was felt that a second measure of intelligence, this time as a criterion variable, was not only desirable but essential. It was felt that the Peabody scores might mitigate what, at that time, seemed to be serious shortcomings in the Binet test. Consequently, the Peabody Picture Vocabulary

Test was administered to all the children in the experimental and control groups when the project ended.

Metropolitan Readiness Test

As previously indicated, a number of consulting, research, and project staff were engaged in dialogue regarding the selection of an appropriate test of reading ability for evaluation purposes in Project Breakthrough. Indecision with respect to the selection of a test threatened delay of the beginning of the project. Dr. Moore suggested at that time that any reading readiness test would be useful as a pre-test instrument to establish simply that the children could not read when they entered Project Breakthrough. Consequently, the Metropolitan Readiness Test was selected as the instrument which would be used for a limited pre-test application. The Metropolitan Readiness Test was also used as a criterion measure since it provided sub-scores for factors such as word meaning, sight recognition, knowledge of the alphabet, and mathematical reasoning.

Vineland Social Maturity Scale

This instrument was recommended by Dr. Norman Washburne since wide differences in the social maturity of the children could also affect project results and should therefore be treated as a significant control variable at the time the children were placed in the project. Others commented upon the possible lack of reliability of this instrument, but again, it seemed to be the one most currently available and widely used for assessing levels of social maturation. It was therefore accepted as another "best choice" from a variety of limited instruments for working with children of this age.

Stanford Achievement Test

The Stanford Achievement Test was administered as a wide range reading test to the parents of the children who participated in Project Breakthrough. These test scores were treated as a control variable since it was deemed essential to eliminate the influence upon study results of differences in the reading ability of the parent. Use of this test was also agreed upon through consultation with Dr. Moore, Dr. Washburne, and Mrs. Ogden.

Administration of a wide range reading test had to be done since prior research clearly demonstrated a very low correspondence between the number of school grades completed by the parents and their tested reading ability.[1] This lack of correspondence naturally invalidated reported grades of schooling as an adequate control for the effects of parental reading ability upon the experimental results.

Other Study Instruments

A number of other study instruments which were developed by the research and project staffs consisted primarily of questionnaires and report forms. These instruments were used to collect and record social characteristic data, test scores, evaluation ratings, absences, etc. Each of these is exhibited in Appendix III and requires only a brief description as follows.

> Social Profile (Exhibit 1): This schedule was used by the casework staff to record social characteristic data for the children and their families.
>
> Coding Instructions (Exhibit 2): These detailed instructions were given to the casework staff for coding the social characteristic data onto the social profile schedule.
>
> Screening Report of Test Results (Exhibit 3): This report was completed by staff of the Psychological Testing Service and forwarded to the research staff. It reported the results of the tests given to the children and their parents.

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[1] Cook County Department of Public Aid, Blackboard Curtain, pp. 39-41.

Report of ERE Activity (Exhibit 4): A periodic report was completed by the project staff for each child regarding the number of days and minutes spent in training with the ERE equipment. Project absences for each child were also reported on this document.

Report of Intensive Casework Activity (Exhibit 5): Periodic reports were required for each child regarding the number of contacts and the method of contact (home, office, or telephone) with the family. These were completed by the intensive casework staff and forwarded to the research staff.

Report of Regular Casework Activity (Exhibit 6): This served the same purpose as the previous report but for the families who received regular casework services.

Family Functioning Instrument (Exhibit 7): This instrument was developed by the research staff in collaboration with the staff members and intensive caseworkers of Project Breakthrough. In the first part of the instrument, each family was rated on a seven-point scale from inferior to superior on fifty test items conceived as measures of specific areas of ability to function as a family unit. The 32 items comprising the second part of the form dealt mainly with physical facilities and possessions in the home and with specific urban experiences. This instrument was used as both a control and criterion measure in the project and is discussed in greater detail in a later section.

Data Collection

The intensive caseworkers assigned to Project Breakthrough completed social profile reports for all the participating families (Appendix III, Exhibit 1). Except for the few case identification entries which were drawn from agency records, all other information was obtained through interviews with the responsible adult in each family. In most cases, this interview took place before the parent and child reported for initial testing; a few interviews were held shortly after that time. In all instances, the interviewee who supplied the social profile information was the same adult who was tested. At the same time the intensive workers scheduled the family for testing, completed the case identification section of the screening report (Appendix III, Exhibit 3), and forwarded this report to the testing staff. Personnel of the Department's Psychological Testing Service entered test results on the screening report for transmittal to research staff. This routing procedure was devised so that test scores would not be available to the caseworkers and possibly influence the later judgments they would be asked to make, even though at that time the intensive caseworkers did not know which children would be assigned to them. Post-test scores were obtained in the same way. All test scores were twice checked by research staff to ensure computational accuracy.

Project Breakthrough staff furnished information about the nature of the training experience and performance progress for the two experimental groups. At the project site the booth attendants maintained a daily log for each child in order to individualize the training. One of the log entries was the number of minutes the student actually spent in the ERE booth. An automatic timer on the booth's control panel was started upon his entry and stopped upon his exit. Summaries of the time spent in the booth, the number of training sessions, and the number of unexplained absences were recorded in the daily logs and periodically submitted to the research staff (Appendix III, Exhibit 4). Project staff consolidated other information contained in the daily logs and submitted an activity and performance report, in tabular form, for the total period each student was engaged in the project. One portion of this report dealt with the number of transfer sessions each child had attended, the number of ERE and transfer sessions he chose not to attend, and the times he was purposefully away from the project site for medical examinations or other scheduled reasons. Another portion of the tabular report showed the number of training sessions each student had required in order to reach different levels of performance.

The Family Functioning Instrument was completed by both intensive and regular caseworkers in March and again in July of 1967 (Appendix III, Exhibit 7). While some of the children in the final research sample had been assigned to the project as early as November, 1966, a lapse in completing the pre-test Family Functioning Instrument was necessary to allow the intensive caseworkers time to become acquainted with the families assigned to them. The intensive caseworkers had to accomplish this during the same period that recruitment efforts demanded much of their time. As a quantitative measure of casework activity during the project, caseworkers periodically reported the number of visits and telephone contacts they made with the families (Appendix III, Exhibits 5 and 6).

The contents of all the foregoing forms were coded onto data summary sheets and keypunched by the Department's Data Processing Unit, where requested computations were prepared.

Criterion Measurements

The main purpose of the study was to determine outcome results of the two experimental variables: training exposure and social work treatment. To do so, it was necessary to devise adequate measures of learning performance on the one hand, and treatment effects on the other. In either case, measurement problems were encountered. In turn, special instruments had to be developed and certain assumptions made.

Four separate instruments were used to measure the effects of the training variable. These were the Stanford-Binet Intelligence Scale, the Peabody Picture Vocabulary Test, the Metropolitan Readiness Test, and the Reading Elements Achievement Test. The first three have been described earlier as standardized tests, the results of which also served as control variables to assess the similarity of the four groups. The Metropolitan Readiness Test served well as a criterion measure, but the two intelligence scales posed different problems. As criterion measures, it was assumed that the two intelligence scales would reflect, in this context, increases in the children's ability to understand and manipulate the real world through the use of language symbols. As such, changes in IQ scores would not be taken to mean that the basic equipment of the child, in terms of inherent intelligence, had or had not been modified. Rather, changes in IQ scores would be interpreted as changes in knowledge or learning and would reflect the result of the training experience.

Reading Elements Achievement Test (REAT)

The Reading Elements Achievement Test was designed by the staff of Project Breakthrough in an effort to record and measure specific areas of language growth. The test consisted of a measure of the child's use of six different components of reading skill: recognition of letter and number shapes, recognition of the names of numbers and letters, association of letter and number shapes to their names, knowledge of upper-case letters, knowledge of lower-case letters, and knowledge of phonetic elements. The unit of measure for each of these skill areas consisted of the number of training sessions the child required in order to demonstrate knowledge of each skill component. Assessment of skill level was both subjective and dichotomous. That is, the tester had to judge the performance of the child and indicate each day whether the child could perform the task presented during the training session. The limitations of this measure are two-fold: the measurement device (number of sessions) could not be applied to the children in the two groups who received no ERE training, and the Reading Elements Achievement Test has not been tested for validity or reliability with large groups of children.

At the end of the project an evaluation rating scale was developed to show the child's final REAT standing. The rating scale consisted of nine points or evaluation categories. The first two do not fall within the definition of language elements, but they were included since they represented the first stages of training in the project. These were the initial phases of training during which time the child was permitted random exploration of the ERE Talking Typewriter and the period of time when he demonstrated movement from random to more systematic exploration of the equipment.

When the project was terminated, the booth attendants evaluated the final standing of each child in the experimental groups. The ratings were based upon a review of each child's work over the course of the entire project. The data used for the review were the daily recordings of the child's ability to perform in the six language areas described above. A final rating category of "ability to recognize sight words" was added to the scale. (Definitions are shown as Exhibit 8, Appendix III.) Thus, the REAT scale of final standing in the project consisted of the following achievement levels:

1. Random exploration
2. Systematic exploration
3. Recognizes letter shapes
4. Recognizes letter names
5. Knows shapes and sounds
6. Knows upper-case letters
7. Knows lower-case letters
8. Knows phonetic elements
9. Recognizes sight words

A final REAT rating of seven, for example, meant that the child had progressed through the first six performance levels and at the end of the project gave clear evidence that he knew many of the lower-case letters. A rating of nine meant that the child had progressed through the first eight levels and gave clear evidence of ability to recognize many sight words.

Thus far, the REAT scale has not been tested for reliability, but an effort was made to evaluate the validity of this measurement device. That is, in using this scale, were abilities in the specified language areas really being measured, or was the device measuring entirely different skills? It was reasoned that the child must have demonstrated ability in these language components if he were also to demonstrate ability on the Metropolitan Readiness Test. That is, he could not read unless he possessed skills in "reading elements."

The performance level ratings (REAT scores) were therefore compared with the post-test scores on the Metropolitan test. This comparison assumed the Metropolitan test to be reliable and valid; it thus was used as an external validity criterion for the REAT scale. The validity test was based upon a Pearson correlation between the two measures which yielded a value of r = .62. Since predictive validity coefficients such as this range typically from .40 to .60 with a median value of about .50, the validity coefficient of .62 augured well for the REAT evaluation. On the basis of these findings, it was concluded that the Reading Elements Achievement Test is a valid criterion measure of the language components discussed above.

Family Functioning Instrument (FFI)

The difficulty of measuring the effect of the social work treatment variable was acute. The field of social work has traditionally laid little stress upon quantitative measures of social functioning, and there are few such test devices available. The experimental vs. control group study design was selected as the best means of identifying differences in performance which could be attributed to differences in social work treatment. However, it was desirable to have, if possible, another measure of the effectiveness of social work treatment differences. Thus, the Family Functioning Instrument (Appendix III, Exhibit 7) described earlier was developed to fulfill this requirement.

The concept of "family functioning" for purposes of this study is taken to mean those ways in which the family, as a unit, conducts those daily affairs which are felt to have a significant impact upon the growth and development of the child's intellectual skills. The task of selecting, or even identifying, all areas of social functioning which would meet that definition was an impossible one. It therefore became necessary to establish a frame of reference for the identification of those areas of family functioning which would be considered. Since the focal point of an assessment of levels of family functioning was the impact upon the educative process for young children, it was felt that six process variables which described the home environment would provide guidelines suitable to develop a test of family functioning. A study of the effects of the home environment upon intelligence and school learning by R. H. Dave indicated that the home environment functions as a powerful influence on the language development of children. The six process variables Dave used to describe the home environment follow: achievement press, language models, academic guidance, activity in the home, intellectuality, and work habits.[1] Thus, a number of test items were constructed in an effort to measure the family's ability to function with respect to each of the above six process variables. As indicated previously, each family was rated on a seven-point scale according to the judgments of the casework staff for each of fifty items. Scores were then computed for each family as an overall measure of the level of family functioning.

Two separate scoring procedures were used for the Family Functioning Instrument in anticipation of future test modification and development; a "raw" score and an "adjusted" score were computed for each family. The raw score was nothing more than an average of all items which were filled in (or rated) by the caseworker. The formula for the raw score is:

$$RS = \Sigma X/N$$

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[1] Benjamin S. Bloom, "Early Learning in the Home" (paper presented as the First B. J. Paley Lecture, University of California at Los Angeles, July 18, 1965), pp. 12-14. (Mimeographed.)

where X equals the rating value of the rated item and N equals the number of items which were rated.

Once the raw scores were computed, an item analysis was conducted to determine which of the test items were effective as contributors to the total score. This was achieved by correlating each of the 50 test items for the total study sample with the raw scores. This analysis produced 15 items which failed to produce correlation coefficients which were significant at the five percent level. These items were subsequently rejected and a new score was computed. Thus, the adjusted score consisted of an average of those items which were rated by the caseworkers and which correlated significantly with the raw score. The scoring formula used is:

$$AS = \Sigma X/N$$

where X equals the rating value of the rated correlated item, and N equals the number of rated correlated items.

Unfortunately, there were no other tests or measuring devices used in this project which could be compared to the Family Functioning Instrument and which would serve as an adequate external validity check. There has also been no opportunity thus far to subject this instrument to a controlled experimental test for the purpose of conducting a validity study.

It was possible, however, to examine the Family Functioning Instrument in terms of internal consistency or reliability. This was done by computing a coefficient of internal consistency, r_{tt}, using the split-half method with a Pearson correlation. This procedure was followed independently for all four study groups. In each of the four tests the reliability coefficient, r_{tt}, was found to be equal to or greater than .96 following adjustment with the Spearman-Brown prophecy formula. It is therefore concluded that the Family Functioning Instrument is a highly reliable device, and though an experimental test, was quite useful as a criterion measure in this study.

Analysis of Data

The method of analysis of variance was selected as the primary statistical technique for evaluating the effects of the two independent variables. The advantage sought through the use of analysis of variance is the ability to identify the interactive potential of the training and social work treatment variables. This technique was selected in consultation with Dr. John A. Carpenter. The analysis of variance technique was also used to verify pre-test homogeneity for the four groups of children.

In addition to the use of analysis of variance, the method of covariance analysis was used in evaluating final test results. Since it was thought that the initial IQ scores of the children could affect the performance of the children in regard to the criterion measures, the covariance analysis was used to eliminate any such influence upon the final scores. Further details regarding the analysis of data are discussed in Appendix V.

Throughout the study, the reader may note small discrepancies which at first may appear to be errors of calculation. These are accounted for by the fact that statistical values, reported in printed form, were rounded or truncated to one or two places following the decimal point.

Significance Levels

All tests made to determine whether the study groups were homogeneous at the beginning of the experiment were evaluated on a two-tailed test at the level of $P = .05$. All tests made to evaluate the results of the experiment at the end of the study period were evaluated on a one-tailed test at the level of $P = .05$.

The one-tailed test was used since the training and intensive service groups were uniformly predicted to out-perform the control and regular service groups on the criterion variables. From the point of view of evaluating the results of the project, there is little interest in the possibility that the control groups might out-perform the training groups on some specific measure of progress or achievement. Further details concerning significance levels are reported in Appendix V.

CHAPTER IV

SOCIAL PROFILE OF THE FAMILIES

This chapter consists primarily of a description of the social, economic and educational characteristics of the families of the children who participated in Project Breakthrough. These descriptive data are important, for they show quite clearly that the children included in this study did not begin this training experience with the advantages of most children. Generally speaking, the families were characterized by their poverty, poor education, large size, and spotty employment history with few, if any, marketable skills.

The 136 families included in this study were not randomly drawn from the total public assistance population, but they represent a very large segment of that population. The characteristics of the study group are therefore descriptive of hundreds of other families in Cook County who are receiving assistance. Thus, while these families do not represent the entire population of families with young children on the public aid rolls, they reflect the image of its greater part.

Another major purpose of this chapter is to compare the four groups of families and to establish their similarity in regard to such key factors as educational background, employment history, age, size of family, and length of time on public aid. Differences in family background could have given some of the children a marked advantage in their ability to learn and achieve during the project. Considerable effort was therefore devoted to the task of statistically evaluating the similarity of the four groups. When it is demonstrated that each of the groups had an equal chance of success at the beginning of the project, much greater reliance can be placed upon the findings.

The evaluation of similarity or homogeneity among the four groups was based upon the acceptance or rejection of the "null hypothesis." The null hypothesis states that there are no differences among the groups in regard to the variable or characteristic being studied. This statement is rarely true in a literal sense because small differences are almost always found. However, if the differences are small enough that they could have occurred through chance alone, the null hypothesis is accepted as being true. On the other hand, if the differences among the groups are large enough that they cannot be accounted for through chance alone, the null hypothesis cannot be accepted, and the groups are said to be significantly different in regard to the characteristic under study. Since this method of evaluating the similarity of groups was used throughout the chapter, it will not be necessary to state the null hypothesis for each variable under discussion.

Type of Housing

Most of the families in the study resided in public housing units of the Chicago Housing Authority. These are sound structures built to accommodate families of four to six members. There were 109, or 80.1 percent, of the 136 families residing in the Jane Addams, Cabrini, and Henry Horner housing projects. The remaining 27 families or 19.9 percent lived in private dwellings in the areas served by the Garfield and Madison district offices of the Cook County Department of Public Aid. These are two different housing arrangements which may reflect differences among the four groups. Such possible differences are important since another study currently being conducted by the Department shows that for those families in private dwellings, 75.3 percent in the Madison district and 66.7 percent of those in the Garfield district live in dilapidated or deteriorated structures.

Because of the experimental nature of the study the four groups were compared with respect to the distribution of the two types of housing. The four groups were quite similar, with 28 families in public housing and six families in private housing for Groups I, II and III. Group IV had 25 families in public housing units and nine residing in private structures.

While these differences are very small, they were nonetheless tested for statistical significance. The null hypothesis of no difference between the four groups with respect to type of housing was accepted, and it was concluded that the four groups were homogeneous with respect to the type of housing structure they occupied.

DISTRIBUTION OF STUDY FAMILIES BY TYPE
OF HOUSING UNIT

Type of Housing	Total	Group I	Group II	Group III	Group IV
Total	136	34	34	34	34
Public	109	28	28	28	25
Private	27	6	6	6	9

Chi-Square = 1.21, df = 3, P >.05

While it is not known whether the families who resided in private housing and participated in Project Breakthrough also resided in dilapidated or deteriorated structures, the above data do not indicate that differences in type or condition of housing constitute a special advantage for any of the four groups.

Assistance Category

The overwhelming majority of the families received assistance under the Aid to Families with Dependent Children (AFDC) program. Of the 136 families, 130 or 95.6 percent received assistance through the AFDC program. Six or 4.4 percent were cases in which the grantee (the person in whose name the case is registered) received assistance through the Assistance to the Aged, Blind and Disabled (AABD) and General Assistance programs.

DISTRIBUTION OF STUDY FAMILIES BY
CATEGORY OF ASSISTANCE

Assistance Category	Total	Group I	Group II	Group III	Group IV
Total	136	34	34	34	34
AFDC	130	32	32	33	33
Other	6	2	2	1	1

Chi-Square = 0.70, df = 3, P >.05

Inspection of the above distribution reveals that the four groups were highly similar in regard to the type of assistance they received. Even so, the differences were tested and found to be not significant.

Race

Little discussion is needed regarding the racial distribution of the sample: all but one family were Negro. This characteristic of the sample differs from the larger assistance population since 15.5 percent of the families receiving Aid to Families with Dependent Children assistance in Cook County are white.[1] The racial make-up of the sample reflects the greater concentration of non-whites in the areas served by Project Breakthrough.

Size of Family

The families of the children in Project Breakthrough were typically large. Only 25.8 percent had four or fewer members, 16.9 percent had five members, and the remainder or 57.3 percent had six or more members in the family unit. Clearly, the children in Project Breakthrough did not come from small families where the mother could give large portions of her time to an individual child.

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[1] Illinois Department of Public Aid, Division of Research and Statistics, Characteristics of Recipients of the Federally-Aided Programs in Illinois: June, 1967, Table 2, p. 5.

DISTRIBUTION OF STUDY FAMILIES BY
SIZE OF FAMILY

Persons Per Family	Total	Group I	Group II	Group III	Group IV
Total	136	34	34	34	34
2	2	-	1	1	-
3	8	2	3	1	2
4	25	6	5	9	5
5	23	2	10	6	5
6	21	6	4	2	9
7	18	6	1	8	3
8	13	4	3	2	4
9	14	5	3	2	4
10 or more	12	3	4	3	2

The average family size was 6.4 members, but there were small differences among the four groups: 6.9 members for Group I, 6.1 for Group II, 6.1 for Group III, and 6.4 for Group IV. These averages were tested and the differences were not significant (Table IV-1).[1]

If the size of the family can be regarded as one measure of the mothers' (or other responsible adults') opportunity to spend time with an individual child in teaching, reading and attending to his needs, there is little evidence in this study that such opportunity differences functioned as a special advantage for any of the four study groups.

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[1] The statistical method of analysis of variance is used throughout this study to evaluate differences between means, and the results of these tests are shown in Appendix IV. Table numbers cited in the text identify both the appendix and the location of the table in the appendix: the Roman numeral identifies the appendix and the Arabic numeral represents the specific table.

Family Composition By Sex

Male or female dominance within a family may influence the development of attitudes and values toward educational achievement. This may in turn affect the behavior and response pattern of individual children in an educational setting. While the purpose of this study does not include an effort to treat such a topic, sex differences have been noted in regard to such behavioral mechanisms as aggressiveness, dependency, passivity, and, even more important, intellectual achievement.[1] If it is possible that children coming from large families composed mainly of males would achieve differently from children of large families composed mostly of females, it would be important to control for such sex-related differentials.

DISTRIBUTION OF STUDY FAMILIES BY SEX OF MEMBERS

Sex of Members	Total	Group I	Group II	Group III	Group IV
Total	871	235	207	209	220
Males	358	108	88	83	79
Females	513	127	119	126	141

Chi-Square = 5.10, df = 3, P >.05

Data were collected which described the family composition by the sex of its members as a means of evaluating group similarity in this regard. There were 871 family members in the four groups; 41.1 percent were males and 58.9 percent were females. The distribution among the four groups showed some differences, but when these were tested, they were not found to be statistically significant.

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[1] Bloom, Stability and Change, pp. 143-56.

Since the groups were found to be highly similar in regard to the sex of family members, it was concluded that the potential effects of sex-related differences in attitudes and values of the family toward educational achievement did not constitute a special advantage for any group.

Age of Tested Adult

Dates of birth were obtained for the adults who were given reading tests at the time of screening. Their ages were then computed as of August, 1967, the month the experiment ended. For all practical purposes, the age information is descriptive of the children's mothers; only five or 3.7 percent of the 136 tested adults were other relatives.

The ages of the mothers in the four groups were important as control elements in the research design, since the parent's age reflects, in a general way, the history of the family. Mothers who are in their early adult years are just starting their families; those in their middle years have most of their children residing at home; and older mothers are generally caring for adolescent children who are either beginning high school, finishing their schooling, or preparing to leave home. Age differences among parents imply differences in life styles, child-rearing experience, family structure, and other patterns of family life. Large differences in the parents' ages could possibly account for changes in experimental results and thus must be accounted for or eliminated.

The average age of all tested adults was 33.0 years. The mean age figures were 33.8 years for Group I mothers, 31.7 years for Group II, 32.8 years for Group III, and 33.5 years for Group IV. In relation to findings to be presented in the next chapter, the mothers were typically in their late twenties and already had several children when the child who participated in Project Breakthrough was born.

The small differences in the mean ages of the adults were tested and found to be not significantly different (Table IV-2). It is concluded, therefore, that there is no evidence in these data which indicates that differences in the ages of the mothers in the four groups account for differences in performance at the end of the project.

Marital Status

One-parent homes were typical of the study families. In only 25 instances, or 18.4 percent of the families, were two parents present. Desertion, separation or divorce had broken up 93, or 68.4 percent, of the homes. Three women or 2.2 percent were widows, and fifteen or 11.0 percent had never married.

DISTRIBUTION OF STUDY FAMILIES BY
MARITAL STATUS

Marital Status	Total	Group I	Group II	Group III	Group IV
Total	136	34	34	34	34
Single	15	5	5	3	2
Married	25	7	6	7	5
Broken*	93	22	23	24	24
Widowed	3	-	-	-	3

*This group includes desertions, separations and divorces.
Chi-Square = 7.84, df = 9, P >.05

These data represent rather widespread marital crises, and it was essential to compare the four groups to determine whether large differences in the distribution of marital crises were present. When the group differences were tested and found to be not significant, it was concluded that marital crises, as reflected by the marital status of the families, did not function as a special impediment for any group in its ability to obtain higher ratings at the end of the project.

Educational Background

As a precautionary measure to safeguard the reliability of the experimental findings, greater stress was laid upon the educational background of the adults in the family. The educational level of parents and relatives can, and in many instances does, function as a powerful determinant of the child's ability to learn and achieve in a school setting. It was not possible to collect a wide variety of data regarding the parents' education, such as grade point averages, school achievement test scores, concentration in fields of study, or even a measure of intelligence. However, a number of variables for which data were relatively easy to obtain were used as control variables to evaluate the possible effect of the parents' education upon the achievement of the children in the project. Each of these will be discussed separately.

Most of the information in this and succeeding sections of this chapter was obtained through interviews with a responsible adult in the family at the time of screening. As noted in the preceding chapter, the interviewed adult was also the same person who was tested for reading ability. In all but one instance, this adult was a responsible female in the family, and in all but another four cases, she was the mother. Thus the information about the mothers was in most cases given by the mother herself. On the other hand, the information about fathers was reported by the adult female, most often the wife.

Years of Schooling of the Father

The previous discussion of marital status for the families revealed that there were only 25 families in which both the mother and father were living together. When this number is divided among the four groups, the very small frequencies for each group make it difficult to evaluate the educational data for the fathers through statistical methods. Nevertheless, comparisons were made which showed that seven fathers in Group I completed an average of 8.0 years of school, six fathers in Group II averaged 7.8 years of schooling, and the seven and four fathers in Group III and Group IV averaged 11.0 and 9.3 years of school, respectively. School information was not obtained for one father in Group IV.

It was first suspected that the presence of only 25 fathers in the homes of 136 children would have very little impact upon the performance of the entire sample. However, if the fathers had been concentrated in one of the study groups, their presence may have functioned as an advantage for that group. That such a concentration did not occur is demonstrated by the following table, and when tested, the group differences were found to be not significant.

DISTRIBUTION OF FATHERS IN THE HOMES
OF STUDY FAMILIES

Presence of Father	Total	Group I	Group II	Group III	Group IV
Total	136	34	34	34	34
Present	25	7	6	7	5
Absent	111	27	28	27	29

Chi-Square = 0.54, df = 3, P >.05

On the other hand, the fathers in Group III had completed an average of 11.0 years of schooling, compared with only eight or nine years for the other groups. The differences among the four groups with respect to the father's achievement level were also tested. Significant differences were found and it was then necessary to conduct further tests to determine which of the differences in the four groups were the significant ones. The results of these tests are summarized as follows:

1. The null hypothesis of no difference between those groups receiving ERE training and those who received no ERE training was tested and accepted; but
2. The null hypothesis of no difference between the groups who received intensive social work services and those who received regular social work services was not accepted on the basis of test results (Table IV-3).

It was therefore concluded that the difference in average number of years of schooling for the fathers of children who received ERE training (an average of 9.5 years for Groups I and III) compared with those who received no ERE training (averaging 8.4 years for Groups II and IV) was not large enough to give either of these two groups a special advantage. On the other hand, the difference in the fathers' years of schooling for those families receiving intensive social work services (a mean of 7.9 years for Groups I and II) compared with those who received regular social work services (with a mean of 10.4 years for Groups III and IV) was large enough to be treated as significant.

Two points should be kept in mind in regard to the latter conclusion. First, it is dubious that an advantage of 2.5 years of schooling for eleven fathers present in less than one-fifth of the homes could markedly affect the outcome of all 68 children receiving regular casework services. The second point is that a connection between types of social work treatment and the 2.5 year difference in the fathers' education is at best remote. The pertinent fact is that the educational backgrounds of the 24 fathers for whom information was available were similar for the groups who received ERE training and those who did not.

Years of Schooling of the Mother

A similar analysis for the mothers of the children in the four groups was conducted and can be summarized very briefly. The average number of years of schooling completed by the mothers was 8.8 for Group I, 9.1 for Group II, 9.5 for Group III, and 9.2 for Group IV. (This information was not reported for one mother in Group II and for one in Group IV.) These differences were not significant (Table IV-4). It was therefore concluded that the educational backgrounds of the mothers, as measured by grade level achievement, probably had no influence on the ability of any of the groups to attain better performance ratings.

Years of Schooling of the Tested Adult

During the screening and testing phase of Project Breakthrough, data regarding number of years of schooling were obtained for the adult accompanying the child to the project site. Most of these adults were the children's mothers: of the 136 adults tested, there were only three maternal grandmothers, one aunt, and one father. The average number of years of schooling completed by these adults was 8.7 for Group I, 9.1 for Group II, 9.4 for Group III, and 9.2 for Group IV. The differences were not significant (Table IV-5). It was concluded that the educational background of these adults did not constitute a special advantage for any group as an aid to attaining better ratings.

Reading Level of the Tested Adult

Perhaps the most critical control data in regard to the effect of educational background upon the children's performance were the Stanford Achievement Test scores of the tested adults. These data parallel the findings of previous research and show that the average reading ability of the 136 tested adults was only at the 5.2 grade level.[1] In contrast, preceding findings showed that the 134 adults whose school backgrounds were known had completed an average of 9.0 years of schooling. This represents not only a severe deficit in the number of years of schooling obtained but also a performance lag of 3.8 years between school attainment and tested reading ability.

While it seems apparent that these data described a significant deficit in the children's environment, it is nonetheless important to determine whether tested reading levels of the adults were evenly distributed among the four groups. Test results failed to indicate significant differences, and it was concluded that the reading ability of the adult in the home did not function as a special advantage for any of the groups (Table IV-6).

These are exceptionally important findings, for they independently replicate the results of earlier studies of adults receiving public aid: one in 1962 involving residents of another Chicago neighborhood, and the other in 1963 of those living in a southern Illinois community.[2] It is this dropout pattern and educational deficiency which are the target problems attacked by Project Breakthrough. These findings reassert the lack of correspondence between tested and reported educational achievement for recipients of public assistance; only 21 percent of the variance in tested reading ability can be accounted for by the variation in reported years of schooling.[1]

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[1] Cook County Department of Public Aid, Blackboard Curtain, p. 90; and Cook County Department of Public Aid, First, They Must Read: A Study to Determine the Literacy Level of Able-Bodied Persons Receiving Public Assistance in East St. Louis, Illinois (Chicago: Cook County Department of Public Aid, 1964), pp. 99-100.

[2] Ibid.

Work History

A limited number of data were obtained regarding the types of jobs and length of employment for the parents of the children. Work histories were felt to be potentially important as control variables since they are one index of the economic stability of the family. Wide differences among the four groups in regard to the parents' work history could possibly work to the advantage of some children in achieving higher ratings, and it was necessary, therefore, to determine whether such differences were present.

Work Experience of the Father

The father's work experience in this context refers to the type of work the father most frequently had performed or considered to be his major occupation. The job descriptions were categorized according to U.S. Department of Labor guidelines.[2]

The most frequent or major line of work was sought for the 25 fathers who were living at home with their families. Unskilled labor was reported to be the main occupation of eight fathers, semi-skilled labor for seven, and skilled labor for four. Three fathers had most frequently held domestic service jobs, and one had worked in a clerical-sales position. Work experience information was not reported for the remaining two fathers.

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[1] The Pearson product moment correlation between reported years of schooling and Stanford test scores was 0.46; significant at $P < .05$.

[2] U.S. Department of Labor, Manpower Administration, Bureau of Employment Security, Dictionary of Occupational Titles (2 vols., 3rd ed.; Washington, D.C.: U. S. Government Printing Office, 1965).

For statistical testing, the four fathers with clerical-sales and domestic service experience were grouped into one category with the two fathers with unknown occupations.

DISTRIBUTION OF FATHERS PRESENT IN STUDY HOUSEHOLDS BY WORK EXPERIENCE

Father's Work Experience	Total	Group I	Group II	Group III	Group IV
Total	25	7	6	7	5
Skilled Labor	4	-	1	2	1
Semi-Skilled Labor	7	1	4	-	2
Unskilled Labor	8	2	1	4	1
All Other	6	4	-	1	1

Chi-Square = 14.78, df = 9, P >.05

The statistical test conducted on the above regrouped data indicated no significant differences. It was therefore concluded that the differences in the work experience of the fathers were not great enough to constitute a special advantage for any of the groups.

Work Experience of the Mother

The analysis of the work experience of the mothers in each of the four groups was similar to that for the fathers. Again, work experience meant the most frequently held job or the major occupation. Of the 136 mothers, 46 women or 33.8 percent listed unskilled labor as their major work experience, eight or 5.9 percent listed semi-skilled labor, and only seven or 5.1 percent indicated that skilled labor had been their major occupation. There were 29 mothers or 21.3 percent who had no work experience and two or 1.5 percent whose work backgrounds were unknown. Professional or semi-professional jobs were reported for another two, clerical and sales positions for 16 mothers or 11.8 percent, and domestic service jobs for 26 mothers or 19.1 percent.

DISTRIBUTION OF MOTHERS BY
WORK EXPERIENCE

Mother's Work Experience	Total	Group I	Group II	Group III	Group IV
Total	136	34	34	34	34
Professional	2	-	-	2	-
Clerical and Sales	16	1	3	4	8
Domestic Services	26	9	7	3	7
Skilled Labor	7	2	1	3	1
Semi-Skilled Labor	8	3	3	1	1
Unskilled Labor	46	8	11	14	13
Unknown	2	2	-	-	-
None	29	9	9	7	4

Chi-Square = 29.12, df = 21, P >.05

Again, the statistical test indicated no significant differences. It was therefore concluded that differences in the mothers' work experience did not function as a special advantage for any group.

Job Stability of the Father

The length of time a person remains on one job can be treated as one measure of job stability. Differences among individuals must, of course, be influenced by such factors as type of job, age of the person, and skill level. Since these factors were not accounted for, the length of time each father remained on his longest job must be regarded as a very rough measure of job stability. Two other limitations were that the data represented only 25 fathers and the information was grouped into unequal class intervals. This complicated the analysis considerably, but a few important observations are worth pointing out.

Perhaps the most outstanding observation is that 12 men or 48.0 percent of the fathers had spent less than three years on the longest job they had ever held. It should be pointed out, however, that respondents could not specify the time spent on the longest job for eight of the fathers. This is a very large proportion of a very small sample, and if data were available for these fathers, an altogether different result might have been obtained. On the other hand, the additional data -- regardless of content -- would not improve the finding that at least 48.0 percent of the fathers had spent less than three years on their longest job. The true proportion could be greater but not less.

While age information was not obtained for the fathers, it must be remembered that the average family size for the four groups was more than six persons, and therefore the fathers probably were not so young as to mitigate entirely this indication of very low job stability. Two of the fathers, out of the 17 for whom data were obtained, held their longest job for less than one year, and ten remained on their longest job at least two years but less than three. The remaining five worked on their longest job as follows: one from 3 to 5 years, two from 5 to 10 years, one from 10 to 15 years, and one for 15 years or more.

The median length of steady employment for the 17 fathers was 2.6 years.

DISTRIBUTION OF FATHERS PRESENT IN STUDY HOUSEHOLDS BY LONGEST TIME ON ONE JOB

Father's Longest Job (Years)	Total	Group I	Group II	Group III	Group IV
Total	25	7	6	7	5
0.5 - 0.9	2	1	-	-	1
2.0 - 2.9	10	2	4	3	1
3.0 - 4.9	1	-	-	-	1
5.0 - 9.9	2	1	-	1	-
10.0 - 14.9	1	1	-	-	-
15.0 or more	1	-	-	1	-
Unknown	8	2	2	2	2

Chi-Square = 14.03, df = 18, P >.05

As indicated by the statistical test, job stability of the fathers, as assessed by these data, did not function as a special advantage in favor of any group obtaining better scores.

Job Stability of the Mother

The same analysis was conducted regarding the mothers' job stability. Several notable differences were found. As already noted, a number of mothers had no known job history (31 or 22.8 percent), and a measure of the job stability did not apply. Of the 105 mothers with work experience, 74 or 63.6 percent had worked less than three years on their longest job as compared with only 48.0 percent of the fathers. The median was 1.7 years for the mothers as compared to 2.6 years for the fathers.

DISTRIBUTION OF MOTHERS WITH WORK EXPERIENCE
BY LONGEST TIME ON ONE JOB

Mother's Longest Job (Years)	Total	Group I	Group II	Group III	Group IV
Total	105	24	25	26	30
0.1 - 0.4	22	8	8	1	5
0.5 - 0.9	14	2	5	3	4
1.0 - 1.9	21	6	2	7	6
2.0 - 2.9	17	2	4	7	4
3.0 - 4.9	11	2	2	3	4
5.0 - 9.9	17	3	4	5	5
10.0 - 14.9	2	-	-	-	2
15.0 or more	1	1	-	-	-

Chi-Square = 23.36, df = 21, P >.05

A test for similarity was made regarding those mothers who had work experience to determine if there were significant differences among the groups. None were found and it was concluded that differences in the job stability of the mothers, as measured by these data, did not constitute a special advantage for any group.

DISTRIBUTION OF STUDY MOTHERS BY
WORK EXPERIENCE HISTORY

Mother's Work Experience History	Total	Group I	Group II	Group III	Group IV
Total	136	34	34	34	34
Work Experience	105	23	25	27	30
No Work Experience	31	11	9	7	4

Chi-Square = 4.43, df = 3, P >.05

Since there were 31 mothers who had no known work experience, it was felt that a concentration of these mothers in one of the groups might create a bias in the final scores at the end of the project. The four groups were therefore compared with respect to the number of mothers who had work experience and those who had none. No significant differences were indicated by the statistical tests. Thus, there is no evidence to indicate that differences in the presence or absence of work experience by the mother created an advantage for any group.

Time on Assistance

The total length of time each family had spent on the public assistance rolls is the last item in the social profile of the families whose children participated in Project Breakthrough. As a descriptive variable, time on assistance is sometimes used as an indicator of the family's social and economic status. However, because the length of time a person or family receives assistance is related to age, the size of family, work skills, and a variety of crises (in addition to variation in local standards of assistance and eligibility requirements), it is not a stable index of the functional capacity of the families. Nevertheless, as a rough measure of the families' ability to maintain an economically independent existence, information concerning the length of time on public aid was obtained for comparative purposes.

The initial research plan was to obtain data regarding the total length of time the family received assistance. This was defined as the length of time the responsible adult in the family received public assistance from her eighteenth birthday through the interview date. However, the social profile study instrument did not include that definition, and caution must be exercised in interpreting this information.

In many studies and on many forms which public aid caseworkers complete in the normal course of their working day, the dimension sought regarding public aid dependency is the continuous time lapse since the last opening of the assistance case. Because of the failure to specify the intended definition of "total time on assistance," and because of the definition commonly used in the Department, it is probably more accurate to interpret this information to mean continuous time on aid since the case was last opened.

DISTRIBUTION OF STUDY FAMILIES BY
TOTAL TIME ON PUBLIC ASSISTANCE

Years On Public Aid	Total	Group I	Group II	Group III	Group IV
Total	136	34	34	34	34
0.0 - 0.4	3	2	-	-	1
0.5 - 0.9	3	-	-	1	2
1.0 - 1.9	11	3	3	2	3
2.0 - 2.9	13	1	1	7	4
3.0 - 4.9	24	3	10	4	7
5.0 - 9.9	62	15	17	15	15
10.0 - 14.9	15	7	3	4	1
15.0 or more	4	2	-	1	1
Unknown	1	1	-	-	-

Chi-Square = 25.48, df = 21, P >.05

It was found that the majority, or 59.6 percent, of the study families had relied upon public aid for a period of five years or more. Only 12.5 percent had spent less than two years on public aid, and about one-fourth (27.2 percent) had depended upon public aid for two to five years. Excluding the one family for whom this information was not supplied, the median period of assistance was 6.0 years. While precise information was not available for comparison, it appeared that the Project Breakthrough families were larger than others in the same economic strata and their assistance histories were somewhat longer.[1] This comparison is, of course, based upon the assumed definition of time on assistance mentioned earlier.

In making statistical comparisons, it was assumed that errors arising from lack of proper definition for this variable were spread evenly among the four groups. A statistical comparison of the four groups revealed no significant differences with respect to the reported time on assistance. Thus, it was concluded that differences in length of time on assistance did not favor or retard any group.

Summary

This chapter has involved a somewhat lengthy and technical treatment of a limited amount of data which describe the families of the children who participated in Project Breakthrough. However, two major purposes have been served: a description of the families was presented, and the four study groups were compared for similarity.

In regard to the first objective, it is clear from these data that the families of Project Breakthrough participants were not typical of families with pre-school children known best to the general population. By definition the families were very poor, and they were found to be very large. Almost all of the families were non-white and in few homes was the father present. The educational background of the responsible adults reflected not only a high dropout rate but also a high degree of functional illiteracy as measured by a standard reading test. Most of the families were further disadvantaged through the possession of low, or at best moderate, job skills, and at least one measure of job stability indicated handicaps in that area. The average age of the responsible adult in the families fell in the early thirties, an age which usually marks the beginning of one of the most productive decades of life. With this array of social, economic, and familial characteristics, a portrait of disillusionment, frustration, and despair is easily painted.

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[1] In June, 1967 the average size of AFDC families in Cook County was 4.8 persons and their median continuous time on public assistance was 3.6 years (Illinois Department of Public Aid, Characteristics of Recipients, Table 2, pp. 5-6).

The second purpose of this chapter, to compare the four groups for similarity, was served by the analysis of 18 different variables. Since there were two types of social work treatment (intensive versus regular casework) and two types of training exposure (ERE training versus no training), the analysis of 18 variables involved 36 different comparisons: 18 to determine the similarity of the groups according to the two different social work treatments, and 18 to determine their similarity according to the two different training exposures. All 36 comparisons were not discussed separately since (1) they were inherent in the statistical devices used, and (2) nearly all the results indicated a remarkable degree of homogeneity among the four groups. In only one instance were the groups found to be statistically different, and that was in regard to the fathers' educational achievement in number of years of schooling. This difference was not significant for the different types of training exposure, but it was for the different types of social work treatment. In addition, the data represented only 24 fathers, and it is doubtful that their education would markedly affect the social work treatment results of the entire study group.

On the basis of data analyzed in this chapter, two important conclusions were drawn:

1. Project Breakthrough has met quite clearly its commitment to provide educational and casework services to a group of children who came from an environment characterized by social, economic and educational deprivation; and
2. There is little or no evidence that the four study groups were sufficiently different with respect to any of the variables discussed in this chapter so as to create a special advantage or disadvantage for any group in obtaining better ratings at the end of the experiment.

CHAPTER V

CHARACTERISTICS OF THE CHILDREN

With their preceding family backgrounds as a backdrop, the youngsters participating in Project Breakthrough become the focus of this chapter. Their sex composition, ages at the beginning and end of the project, their relative position among all their siblings, and pre-school educational experience will be briefly described. In addition, each of these characteristics will be examined to see if inter-group differences were present.

Sex

Both sexes were almost equally represented in the total study group: 49.3 percent of all participants were boys and 50.7 percent, girls. While the two groups of children exposed to the ERE educational experience, Groups I and III, were identical in sex composition, those in Groups II and IV who served as controls had fewer boys (and consequently, more girls) in their midst.

DISTRIBUTION OF CHILDREN IN
STUDY GROUPS BY SEX

Sex of Child	Total	Group I	Group II	Group III	Group IV
Total	136	34	34	34	34
Male	67	20	14	20	13
Female	69	14	20	14	21

Chi-Square = 5.03, df = 3, P >.05

Upon testing, the sex composition of the four individual groups proved not to be significantly different. An examination of the table entries shows that the total participants receiving intensive casework services (Groups I and II) and those receiving regular casework services (Groups III and IV) were quite similar in regard to male and female membership. It is recalled that in selecting the matched sample for the study project, initial recruits were assigned to the intensive caseworkers whose service loads were restricted to Project Breakthrough families. If the later recruits who were assigned to the regular workers had the same sex composition, as was the case, it can then be concluded that a selection bias did not operate through the assignment of initial recruits to intensive caseworkers.

However, as noted earlier, the apparent over-representation of boys in the combined ERE groups (Groups I and III) and their shortage in the control groups (Groups II and IV) prompt further exploration.

SEX COMPOSITION OF STUDY GROUPS WITH AND WITHOUT ERE EXPOSURE

Sex of Child	Total	ERE Training Groups I and III	No ERE Training Groups II and IV
Total	136	68	68
Male	67	40	27
Female	69	28	41

Chi-Square = 4.24, df = 1, P <.05. Corrected for continuity.

The noted difference in sex make-up of the two experimental groups and the two control groups could not be attributed to chance occurrence. On the other hand, the difference arose through an accidental matching bias and was in no way linked to any purposeful manipulation in the research design or in the sample matching process. Rather, the variation in the number of boys and girls comprising the experimental and control groups is to be kept in mind, in the event that study results show achievement differences for the two sex groups.

Age at Start of Project

The ages of the children at the beginning of the study project were obtained in the following way. The ages for the children in the experimental groups (Groups I and III) were calculated by subtracting their birthdate from the date of their first exposure to the ERE Talking Typewriter. The respective date of initial ERE exposure was then used in deriving the age of their matched partner in either Group II or Group IV.

DISTRIBUTION OF CHILDREN IN STUDY GROUPS
BY AGE AT START OF PROJECT

Child's Age at Start	Total	Group I	Group II	Group III	Group IV
Total	136	34	34	34	34
3.0 - 3.4 Years	7	1	1	3	2
3.5 - 3.9 Years	27	6	4	8	9
4.0 - 4.4 Years	57	14	17	14	12
4.5 - 4.9 Years	40	13	10	6	11
5.0 - 5.4 Years	5	-	2	3	-

In Chapter III, it was reported that the initial criterion of 3.5 to 4.5 years of age at time of entry into the project was later extended due to recruitment difficulties. As it turned out, the main effect of this age range expansion was to draw older children into the study groups. The majority of the children or 61.8 percent were from 3.5 through 4.4 years of age when they started the project. Approximately a third or 33.1 percent were older than that, and only seven children or 5.1 percent were younger. The children, when they entered the project, averaged 4.2 years of age.

Age upon starting the project was found to be fairly uniform for the four individual groups, for the experimental and control sub-samples, and for the intensive and regular casework groups (Table IV-7). According to this characteristic and whatever maturational measures it alone reflects, no group of children had a particular edge on any other.

Age at End of Project

While the children entered the research phase of the project at varying times, the project termination date applied to all: August 15, 1967. Consequently, age at the end of the project for all four groups was the time lapse between individual birthdates and the August cut-off point. As noted earlier, in developing the matched samples, the two intensive casework groups were formed first. Thus the length of the project period was longer for Groups I and II. In consideration of that fact, it was expected that the age difference between intensive and regular youngsters would be greater at the end of the project.

The average age of the children at the end of the project was 4.9 years. This meant that the children had been involved in Project Breakthrough for eight months on the average. By the August, 1967 completion date, exactly half of the youngsters were five years old or older.

The analysis of age at completion showed no significant differences among the four individual groups or between those children who received ERE training and those who did not (Table IV-8).

As was anticipated, significant age differences did exist between the intensive and regular casework groups at the time the project ended.

DISTRIBUTION OF CHILDREN IN STUDY GROUPS
BY AGE AT END OF PROJECT

Child's Age at End	Total	Group I	Group II	Group III	Group IV
Total	136	34	34	34	34
3.0 - 3.4 Years	1	-	-	1	-
3.5 - 3.9 Years	5	1	1	1	2
4.0 - 4.4 Years	16	1	2	6	7
4.5 - 4.9 Years	46	13	9	12	12
5.0 - 5.4 Years	54	14	19	8	13
5.5 - 5.9 Years	14	5	3	6	-

An important consideration detailed by the age differences between the intensive and regular casework groups is the different time spans that will be involved in assessing achievement and functioning changes for the two casework groups. For the intensive sub-sample, i.e., Groups I and II, the average length of the project period was nine months. For the regular casework groups (III and IV), the average duration was seven months.

In reference to the training variable, the longer project period for the intensive casework children meant that their Group I members were exposed to the ERE learning experience longer than the second experimental group, Group III. In the same way, the Group II youngsters who received intensive services were rated after a longer period of normal maturation than were their Group IV counterparts. Thus durational differences for the training variable are cancelled out.

For the casework treatment variable, assessments of casework service and its effects for the two intensive groups (I and II) were made after a longer service period than those for the regular casework groups (III and IV). In later sections of this report, the number of ERE sessions attended and the frequency of casework contacts will be examined. What is learned about those two considerations may refine the differences in potential opportunity that have been noted here for the treatment variable.

Birth Rank

The birth order of each participant in Project Breakthrough describes the child's relative age standing among the children in his family and shows the opportunity he had of learning from older siblings. In addition, it is a rough assessment of the child-rearing experience of his mother and the time demands she faced at the time he was added to her responsibilities.

DISTRIBUTION OF CHILDREN IN STUDY GROUPS
BY BIRTH RANK

Birth Rank	Total	Group I	Group II	Group III	Group IV
Total	136	34	34	34	34
1	8	2	2	3	1
2	21	3	12	2	4
3	30	7	4	11	8
4	14	1	4	5	4
5	27	8	3	8	8
6	14	7	2	-	5
7	12	2	4	4	2
8	4	2	2	-	-
9	5	2	1	-	2
10	1	-	-	1	-

The birth ranks of the total study group ranged from first-born to tenth. It is interesting to note that the majority of youngsters involved in the project -- 56.6 percent -- were the fourth or later-born children in their families. The average birth rank was 4.3.

As shown in Table IV-9, all of the study groups were homogeneous in respect to the birth ranks of their individual members. In turn, this meant that no one group of children had a special advantage when the number of older siblings from whom they could possibly learn is considered.

Total and Younger Siblings

The birth ranks of the participants have provided a picture of the children's standing in relation to their older brothers and sisters. The next considerations will be both the total number of children and the number of younger siblings in the families.

The number of children in the study homes ranged from one to 13; the adults had a total of 699 children in their charge. Approximately one-fourth of the families or 27.9 percent had three or fewer children, 46.3 percent had four to six children, and 25.8 percent had seven or more. From the viewpoint of the responsible women in these families, many would be taxed in trying to provide intellectual stimulation to their children.

The average number of children was 5.1 for all study households, 5.6 for Group I, 4.9 for Group II, 4.8 for Group III, and 5.3 for Group IV. The individual study groups were analyzed according to the number of children in the study families and no significant differences were found (Table IV-10).

DISTRIBUTION OF STUDY GROUPS BY NUMBER OF CHILDREN IN THE FAMILY

Number of Children	Total	Group I	Group II	Group III	Group IV
Total	136	34	34	34	34
1	3	1	1	1	-
2	8	2	3	1	2
3	27	6	6	10	5
4	20	1	9	5	5
5	27	7	5	6	9
6	16	7	1	4	4
7	14	4	3	3	4
8	10	3	2	2	3
9	6	1	4	1	-
10 or more	5	2	-	1	2

The following table shows the distribution of the children taking part in the study according to the number of younger siblings.

DISTRIBUTION OF STUDY GROUPS BY NUMBER OF YOUNGER SIBLINGS IN THE FAMILY

Number of Younger Siblings	Total	Group I	Group II	Group III	Group IV
Total	136	34	34	34	34
None	65	19	14	16	16
1	36	7	10	11	8
2	29	6	9	6	8
3	5	1	1	1	2
4	1	1	-	-	-

The typical participant was one of five children, with three older brothers and sisters, and one younger. However, three participants were the only children in their families, and another 62 youngsters or 45.6 percent had no younger brothers or sisters. There were 36 children or 26.5 percent who had one younger sibling, 29 youngsters or 21.3 percent who had two, and six or 4.4 percent who had three or four. The four groups were compared in relation to the number of younger siblings present in the home, and no significant differences were obtained (Table IV-11).

Prior Pre-School Experience

Information concerning previous participation in enrichment programs was gathered for all the children as another assessment of their status upon entering Project Breakthrough. It was learned that fully two-thirds of the children or 67.6 percent had no prior pre-school experience. The remainder or 32.4 percent had some pre-school experience, and in most cases, this was obtained through Project Headstart. Almost a fourth of the children (24.3 percent) had participated in a Headstart program. While that figure represents a minority of the study group, it is still substantial, particularly in view of the fact that the War on Poverty program had not been long in existence.

DISTRIBUTION OF CHILDREN IN STUDY GROUPS BY PRE-SCHOOL EXPERIENCE PRIOR TO PROJECT BREAKTHROUGH

Pre-School Experience	Total	Group I	Group II	Group III	Group IV
Total	136	34	34	34	34
No Experience	92	28	19	27	18
Headstart	33	5	12	5	11
Other Programs	11	1	3	2	5

In comparing the groups on prior experience, the important point was whether previous participation had occurred, regardless of the specific program attended. In addition, it was felt that the effect of such previous experience might contaminate the experimental variable, training exposure. For these reasons, the information in the preceding table was merged for purposes of further analysis.

DISTRIBUTION OF CHILDREN IN THE TWO TRAINING
GROUPS BY PRE-SCHOOL EXPERIENCE STATUS

Training Exposure	Total	Pre-School Experience	No Pre-School Experience
Total	136	44	92
ERE	68	13	55
Control	68	31	37

Chi-Square = 9.71, df = 1, P <.005. Corrected for continuity.

Prior to Project Breakthrough, significant differences in earlier participation in enrichment programs did exist between the children who would be exposed to the ERE learning experience and those who would not. While the control children would not receive the benefit of Project Breakthrough techniques, almost half of them -- 45.6 percent -- had already been involved in some other enrichment program. Only a fifth or 19.1 percent of the experimental group members had done so. It is important to note that whatever advantages that could be derived from the reported differences would favor the control children, rather than those who underwent the ERE learning experience.

At the end of the project, the testing staff was asked to note on the post-test booklets any educational exposure the children in the control groups may have had while the project was in process. According to these reports, 27 children or 39.7 percent of the entire control contingent had taken part in some other enrichment program, primarily Headstart, during the course of the experiment. Those children included 17 youngsters in Group II and ten in Group IV. Since a study form for gathering this information was not provided to the testing staff, it is possible that in some instances the staff members forgot to ask for or record this information. If so, the result that 27 control children were engaged in other programs while Project Breakthrough was in process would be an underestimate. A later check revealed that three children -- two in Group I and one in Group III -- who received ERE training were concomitantly attending Headstart programs.

Four of the 27 control children who attended pre-school programs during the course of Project Breakthrough had enrolled after the project began. The remaining 23 youngsters -- 13 in Group II and ten in Group IV -- had entered those programs before the project and were included in the total of 31 control children with prior experience. (See preceding table.) The other eight children in the latter group had not engaged in any program within the time limits of the experiment. Thus, at the completion of the experiment 35 members of the control groups had at one time or another taken part in enrichment programs; that number included 19 children in Group II and 16 in Group IV. Also by the end of the project, a total of 16 children, equally represented in Groups I and III, who received ERE training had been exposed at some time to another preschool program.

In summary, prior to the project, 45.6 percent of the control groups and 19.1 percent of the experimental groups had already participated in educational programs. By the end of the project, 51.5 percent of the control groups and 23.5 percent of the experimental groups had some contact with other pre-school projects. As noted earlier, the latter two figures could be underestimates. For both time references, the experience advantage lay with the children who did not receive ERE training.

Summary

As a supplement to the knowledge gained about family backgrounds, certain characteristics of the children involved in Project Breakthrough were examined in this chapter. The investigation served two main purposes: to provide the reader with a brief description of the youngsters and to check out inter-group differences which could have a bearing on study results.

For the purpose of description, all but eight children had at least one older sibling, and many had several. The typical Breakthrough participant was one of five children, with three older brothers and sisters, and one younger. The children began the project at 4.2 years of age, on the average, and participated for approximately eight months. While most of the youngsters had not been exposed to any educational program prior to the project, a third had already been involved in Headstart or other programs serving their neighborhood. It was later learned that a fifth or 22.1 percent attended other enrichment programs while Project Breakthrough was in progress, and that figure may be an underestimate.

For each characteristic examined in this chapter, the study groups were compared to see if any differences beyond chance occurrence distinguished one group from another. It was learned that the groups were homogeneous in respect to age at the start of the project, total number of children in the families, birth rank, and number of younger siblings. On each of the other three characteristics considered, discrepancies were noted between certain groups. Significant differences in sex composition were found in comparing the experimental and control contingents: the majority of the ERE participants were boys, while girls were the dominant sex group among the children who did not receive ERE training. A second divergence occurred between the intensive and regular casework groups in relation to age at the end of the project. That difference reflected the varying lengths of time the two groups were involved in the project: the average duration of the project was nine months for the intensive groups and seven months for the regular casework groups. For the intensive groups, the time dimension represented longer potential opportunities in learning, maturation, and service periods. Later chapters will examine the frequency of casework contacts, the number of ERE sessions attended, and other measures which may refine the possible opportunity differences that have just been cited.

The third inter-group difference uncovered was the pre-school enrichment experience of the experimental and control children prior to the start of Project Breakthrough: more children in the control groups -- in fact, almost half -- had taken part in Headstart or other educational programs before joining the Project Breakthrough research sample. Prior participation was reported for less than one out of five children who were later exposed to the ERE learning experience. A sizable portion of the control children also participated in other pre-school programs while Project Breakthrough was in progress. The advantage of other pre-school experience consistently rested with the control children. Thus, in analyzing results, the experimental children will be compared with a control group of some sophistication.

In summary, just as the children in Breakthrough were from highly homogeneous families and homes, they were also similar in regard to the age they began the project, the number of brothers and sisters, and their relative position among the latter. However, it should be kept in mind that the two intensive casework groups were engaged in the project for about two months longer than the two regular casework groups. In addition, in comparison with their control counterparts, the children who received ERE training had proportionally more boys in their midst and were less likely to have been involved in any pre-school education program before they entered Project Breakthrough.

CHAPTER VI

EXPERIMENTAL CONTROL DATA

The most important of the control variables used in this study were those relating directly to the children's educational or intellectual functioning on the one hand and the social maturity or level of social functioning of the children and their families on the other. These two sets of information correspond to the two major thrusts of this study: to assess the effects of training and casework services.

Pre-Test Metropolitan Scores

Prior to the formal beginning of Project Breakthrough, the administration of the Metropolitan Readiness Test for all of the children who would participate in the project was discussed at length. At that time it was felt that the Metropolitan Readiness Test was probably not sufficiently sensitive to evaluate differences among the four groups in regard to actual reading readiness or reading ability. Consequently, the test was administered to only a small group of children in order to simplify initial testing and screening, and these limited test data were used to document only the fact that these very young children were not able to read and write at the beginning of the experiment. Now that the data regarding this experiment have been evaluated, it is felt that the Metropolitan test does provide reasonably sensitive measures for children in this age range.

Only 41 of the 136 children were given the Metropolitan test at the beginning of the experiment, and none of those tested were in either of the control groups. It is therefore not possible to compare those groups who would receive ERE training with their control counterparts. Of the 41 children tested, 24 were in Group I and 17 were in Group III. The 41 children tested obtained an average score of 15.8, those in Group I averaged 14.4, and the Group III children averaged 17.8.

The critical hypothesis relating to these data was that the children did not know how to read at the time they entered the project, and the scores obtained from the Metropolitan Readiness Test support the hypothesis. An average score of 15.8 for the 41 children tested is quite low when compared to the national standard of performance on this test for children beginning the first grade of school. Only 2.0 percent of first graders nationally achieved scores equal to or lower than 15.8. This was also true of the Group I students, but the Group III students' performance was somewhat higher. Nationally, 3.0 percent achieved scores equal to or lower than the 17.8 average obtained for Group III.[1] It should be remembered, however, that the children in Project Breakthrough were about four years old when tested and that their performance has been compared here with a national sample about two years older.

When the differences between the Group I and Group III average scores were tested, they were found to be not significant (Table IV-12). However, the two groups did not represent matched samples in regard to IQ scores, and a second test was performed on the 12 matched pairs of children who were found among the 41 tested. The scores for the matched groups were remarkably similar to those shown above. The average score for the 24 children was 16.1, and the 12 children in Groups I and III averaged 14.8 and 17.4, respectively. These differences were also tested and found to be not significant (Table IV-13). Thus, while a difference of 3.4 points was found between the two unmatched groups in the average scores for the Metropolitan test, and a difference of 2.6 points was obtained for the matched groups, both of these differences could be accounted for by chance alone.

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[1] The score range is 14 to 16 at the second percentile for the Metropolitan Readiness Test; for the third percentile, the score range is 17 to 18.

Pre-Test Stanford-Binet Scores

The Stanford-Binet Intelligence Scale was administered to the 136 children in the four groups in order to determine whether significant differences were present in regard to an intelligence measure. As discussed in Chapter III, there is some doubt that this scale can be regarded as a valid measure of intelligence for this group because it has been standardized on a "middle-class" population. If, however, a bias were present in the use of the Binet scale, it was assumed that such a bias operated in a uniform manner since the four groups of children were so highly similar with respect to so many different variables brought under study.

In other words, were an "unbiased" test administered, the average intelligence of each of the four groups might be assessed at several points higher than those obtained from the Binet scale. The Binet scale may represent an understatement of "true" intelligence for these children, but it is nevertheless regarded as an adequate and unbiased instrument for comparative purposes. There is some question, also, as to whether this test measures "intelligence" of children as young as the participants or whether it represents the extent to which they have learned the fundamentals of word formation, language usage, and familiarity with the use of symbols. The study of such problems is, of course, not the subject of this report, but it is well that they be kept in mind as the data are presented and discussed.

The average intelligence score for the four groups was 89.3, and since the score norm is 100, the children in this study fell below the expected norm by 10.7 points. This may only reflect the test bias discussed above, or it could mean a real deficit, not necessarily in "intelligence," but in early exposure to language development experiences. It is probably a bit of each.

The scores for the separate groups were quite similar. The children in Group I obtained an average IQ score of 89.1, Group II averaged 88.6, and Groups III and IV both averaged 89.8. These very small differences were not significant with respect to the training variable (Table IV-14). This finding is especially important, for a large difference between the experimental and control groups in tested IQ scores could have vitiated the entire results of the experiment. With respect to social work services, a significant IQ difference at pre-test was obtained, but the advantage lay with the regular groups.

Level of Family Functioning

A concentration of stable families in one or more groups and problem families in others could have serious consequences in terms of the experimental results of this study. It is desirable to know, therefore, if such imbalances did occur. In order to assess the equality or homogeneity of the four groups with respect to level of family functioning, the Family

Functioning Instrument developed by the Cook County Department of Public Aid was administered for each of the participating families.

The Family Functioning Instrument scores could vary from as low as 1.0 to as much as 7.0. Two scoring techniques (described in Chapter III) were used to obtain both a raw score and an adjusted score for each family. An average score of 4.0 on either the raw score or adjusted score represents a so-called average or "normal" public aid family; scores falling below 4.0 represent those with problems in family functioning, and scores above 4.0 represent above average families.

The data obtained from the raw score formula produced an average score of 4.1 for the 136 families in the four groups. The average scores for the separate groups were as follows: 4.2 for Group I, 3.9 for Group II, 4.2 for Group III, and 4.1 for Group IV. The differences between these mean scores were not significant (Table IV-15).

The scoring formula used to obtain the adjusted scores yielded data which were highly similar to the raw score averages for the four groups. The average adjusted score for the 136 families was 4.2 as compared to 4.2 for Group I, 4.0 for Group II, and 4.2 for both Groups III and IV. The differences in average adjusted scores for the four groups were also tested and found to be not statistically significant (Table IV-16).

Social Maturity

An important concept which has consequences for both the types of social work treatment and types of training is the level of social maturity of the children. It could be expected that the more socially mature child could best utilize the benefits of casework services provided to his family. It could also be expected that such a child could better profit from a training program since he has already successfully integrated the personal and family experiences which reflect his socially mature status.

An assessment of the level of social maturity for the children was obtained through the administration of the Vineland Social Maturity Scale. This scale does not reflect independent observations of the children by trained staff, but evaluations of the children based on information supplied by the adult tested during screening (in most cases, the mother).

The scores on the Vineland scale are reported as age equivalents. Thus, a score of 6.1 means that the child's measured level of social maturity is equivalent to that of a "typical" child aged six years and one month. Comparison of the four groups at the start of the project yielded average social maturity scores of 5.3 years for Groups I, II and IV, and the average score for Group III was 5.0 years (Table IV-17). The differences among the four groups were not significant, and it was concluded that differences in the social maturity of the children did not function as an advantage for any group in obtaining better scores at the end of the experiment.

Experience of Casework Staff

As discussed previously, the essential difference between the intensive and regular casework staff in Project Breakthrough was in the size of their caseloads. The educational requirement for both the regular and intensive workers was the possession of a bachelor's degree from an accredited college or university. Thus, intensive casework is defined as simply an increased opportunity for the staff assigned to Project Breakthrough to provide services to the children and their families under more optimal conditions of employment. It was hoped that reduced caseloads would permit the intensive caseworkers to apply the full potential of their knowledge and skills in helping the families and their children during assignment to Project Breakthrough. Therefore, the designation of intensive casework services does not imply an effort to utilize more highly developed social work skills but to maximize those which were available.

It was felt, however, that some control should be exerted over the potential differences in the experience of the two groups of casework staff. It seems likely, since the educational level of the two groups of caseworkers was the same, that skills could be expected to improve and mature as a function of the length of time the person is employed as a caseworker. Differentials in skill level could therefore be suspected if there were marked differences between the intensive and regular caseworkers in regard to their length of employment as caseworkers. Such differences could have important consequences for the experimental results.

Data were gathered which showed the length of time each caseworker had been employed by the Cook County Department of Public Aid, and this employment period was accepted as the measure of casework experience. This measurement device ignores the possibility that some workers may have had casework experience prior to employment with the Department. On the other hand, administrative experience shows that the instances of previous casework experience prior to employment by the Department are so few that the problem can be safely ignored.

A complication in comparing the intensive and regular workers for length of casework experience is the large difference in their respective numbers. There were only four caseworkers assigned to Project Breakthrough to provide intensive social work. On the other hand, since the families who received regular casework services did so through the worker assigned to them by their district offices, a total of 43 different regular workers were involved. The average number of years of experience for the four intensive workers was 1.7 years, as compared to an average of 2.4 years for the 43 regular workers. Computation of an average for only four workers is a dubious procedure, but since there were only four, the choices are limited.

The statistical methods used in this study do not lead to definite conclusions through the comparison of the length of casework experience for the intensive and regular caseworkers, but an important observation was made. That is, the intensive workers had relatively less experience than the regular workers. Thus, if experience functions as a significant determinant of the quality of services, the families who received regular social work services probably had an advantage in this regard. It would therefore seem reasonable to suspect that greater improvements in the measure of family functioning by the families in Groups I and II over those in Groups III and IV could not be attributed to longer casework experience.

The best that can be said of these data is that any important differences in casework experience probably operated as a bias against the experimental hypothesis that provision of intensive casework services would produce gains in family functioning which were larger than those produced by the provision of regular casework services.

Summary

Five critical control variables relating to the reading or educational sophistication of the study groups and their levels of social maturity or family functioning were analyzed in this chapter to determine whether any groups had an advantage over the others at the time the project began.

Reading scores were not available for either of the control Groups II or IV and it was therefore not possible to compare them with those who received training in the experiment. Because of the extraordinary similarity of the four groups with respect to so many different control variables tested thus far, it is assumed that there is little or no difference among the four groups with respect to their ability to read.

If there were differences present which were large enough to create a bias, it is expected that any such bias operated in favor of higher scores for the control groups. This statement of expectation is based on the findings of the previous chapter which showed that more control group children had participated in other pre-school training programs before this experiment began.

Though limited in terms of the number tested, the Metropolitan Readiness Test scores clearly showed that the children assigned to the project for training could not read when they began the experiment. The average score for Group III was so low that only 3.0 percent of first graders tested nationally achieved scores as low or lower, and only 2.0 percent did as poorly as, or worse than, Group I.

Data analyzed in this chapter also showed that each of the four groups began the project with very similar intelligence, family functioning, and social maturity scores. Differences in length of casework experience were present between those caseworkers providing intensive services and those providing the normal or regular complement of services available in the Cook County Department of Public Aid. Differences in experience of casework staff favored a better quality of service for families with regular workers, insofar as length of experience functions as a measure of service quality. Also, an IQ difference favored the regular service children.

The important conclusions to be drawn are:

1. There is no evidence that the four study groups were sufficiently different with respect to social maturity or level of family functioning at the beginning of the experiment as to create a special advantage or disadvantage for any group in obtaining better ratings at the end of the experiment;

2. The children who would undergo exposure to ERE training did not know how to read before the project began; and

3. While there was no IQ difference between the ERE and control groups, the regular social work groups did have an average IQ advantage of one point.

CHAPTER VII

A QUANTITATIVE DESCRIPTION OF THE EXPERIMENTAL VARIABLES

In order to properly evaluate the final results of Project Breakthrough, it is important to have at least a brief quantitative description of the experiment. Whether the children received six or sixty hours of instruction would be relevant in interpreting their final achievement. That is, did Project Breakthrough require extensive or little training time in order to raise final achievement scores. Similarly, if the provision of intensive social work services is expected to have any benefit, it must first be shown that these services were in fact more "intensive" than those which were regarded as "regular" social work services. Thus, the purpose of this chapter is to quantify for the reader the two experimental conditions: ERE training and social work services. In order to accomplish that end, several quantitative measures will be examined for each of the experimental conditions.

The ERE Training

In Chapter V it was pointed out that the children in the two experimental groups were involved in the project for approximately eight months, a little less than the customary school year. It is important to translate such a crude measure of the amount of training into the actual number of hours the children in Groups I and III were exposed to the ERE Talking Typewriter. In the same way, the number of transfer sessions attended by the children without the use of the ERE equipment is also relevant.

Any quantitative differences in ERE training between Groups I and III must also be identified in order to obtain clear interpretations of the final results. Since none of the children in the two control groups were given ERE training in Project Breakthrough, they are not included in the following discussion.

Training Time

The 68 children who were given ERE exposure averaged 12.7 hours of training per child. This was the amount of time spent working with the ERE Talking Typewriter, whether in a programmed or non-automated session. The children who received intensive social work services (Group I) spent an average of 14.0 hours in training as compared to 11.3 hours for those who received regular services (Group III). The difference of 2.7 hours of training was significant (Table IV-18).

It was noted that both the Group I and Group III children averaged 1.6 hours of training time per month on the Talking Typewriter over the nine and seven months of respective participation. Thus, the difference in number of hours of training was due to the difference in the total time in the project. This difference is not important in regard to control group comparisons, but a clear advantage was given the Group I children in terms of the amount of training. This difference is important in regard to intensive versus regular social work comparisons; that is, will differences attributed to intensive social work be due to the greater volume of services or will they be due to greater amounts of training.

Number of ERE Sessions

Children in Group I were exposed to more ERE training sessions. However, it was felt that training sessions were essentially another, but less sensitive, measure of training time. A statistical analysis of the differences in the number of training sessions is therefore not presented.

Number of Transfer Sessions

The transfer session was considered to be an important link between the ERE training and the child's ability to apply his knowledge to his home and neighborhood environment. The transfer sessions were introduced about two months after the project began and were thereafter conducted once each week over the remainder of the project period. However, absenteeism and session refusals prevented many of the children from taking part in all of the transfer sessions.

The children who received training averaged only 6.8 transfer sessions per child over the entire project. The children who received intensive social work services (Group I) averaged 8.1 transfer sessions as compared to 5.5 for those who received regular services (Group III). This comparison yields a difference of 2.6 transfer sessions per child in favor of the intensive service group children, and this difference was significant (Table IV-19). This difference may constitute a research bias in favor of intensive services if performance gains are later shown to be related to differences in the number of transfer sessions. The difference would not affect experimental vs. control group comparisons.

Social Work Services

As noted in Chapter V, the children in Group I were involved in the project for about two months longer, on the average, than those in Group III. The intensive caseworkers working with Group I families thus had a greater opportunity to provide services. On the other hand, as discussed in the preceding chapter, the intensive caseworkers were less experienced. The reduced caseloads of the intensive caseworkers, it was hoped, would enable them to offer more services to their assigned families and more fully implement their casework skills. It is therefore important to determine whether quantitative service differences were present and that two distinguishable types of casework services were actually used in the project. In order to do this, the number and types of casework contacts, based on the periodic activity reports submitted by both regular and intensive workers (Appendix III, Exhibits 5 and 6), were examined.

Before evaluating the quantitative differences in the types of casework services, an important distinction should be made. The purpose of providing "intensive" services was to determine whether an increased volume of social work service would prove beneficial, and not to determine whether intensive services were of a higher quality. Two obvious ways to achieve an increase in service volume are: (1) to reduce caseloads so the worker can give more service to fewer families; and (2) to provide services to one group over a longer period of time. The latter method was not deliberately built into the study design since this would result in extended training periods for some children. As noted previously, a time difference did arise, however, as the children in the two intensive service groups were involved in the project about two months longer on the average than were the children in the regular social work groups. While large time differences might create a bias in regard to differences in amounts of training, they do not affect the social work variable. That is, the additional two months of participation increased further the amount of service given to the "intensive" group families. Had the research objective been that of determining whether one group of workers were "better" than another, the two-month difference would be important. However, the research objective is focused entirely on determining the effect of differences in the volume of service given.

Home Visits

One measure of the quantitative difference between the intensive and regular services is the number of times the worker visited the families in their homes. The families who received intensive casework services (Groups I and II) averaged 6.0 home visits by their workers as compared to 2.5 home visits per family for those who received regular services (Groups III and IV). This is a mean difference of 3.5 home visits per family which was significant (Table IV-20). This finding substantiates that the two levels of service were quantitatively different.

On the other hand, the number of home visits should be the same for the ERE groups and the control groups; this similarity would eliminate the possible notion of casework service differences biasing the performance measure for ERE vs. control group comparisons. The families of children who received ERE training (Groups I and III) averaged 4.2 home visits by their workers and those in the control groups (Groups II and IV) also averaged 4.2 home visits.

An additional finding was that the difference in the number of home visits between Groups I and III was much larger than that for Groups II and IV. The families in Group I averaged 6.4 home visits while those in Group III averaged only 2.1, a difference of 4.3 home visits in favor of those who received intensive services and whose children received ERE training. The control group families who received intensive services

(Group II) averaged 5.5 home visits by their workers while the control group families who received regular services (Group IV) averaged 3.0, a difference of 2.5 visits in favor of the intensive service families. A comparison of these sets of differences (4.3 - 2.5) shows that there was a difference of 1.8 home visits in favor of the ERE intensive children (Group I) and this difference was significant (Table IV-20). Thus, whenever performance gains favor the combination of ERE training and intensive services, this difference must be accounted for.

Collateral Visits

Quantitative differences were also found between the intensive and regular casework groups in regard to the number of collateral visits made by the caseworker. A collateral visit was one in which the caseworker called upon outside persons, such as teachers, doctors or relatives, in order to explore problems of school achievement, health care, family support, etc. The intensive caseworkers conducted an average of 1.6 collateral visits for each family assigned to them as compared to 0.3 collateral visits per family by the regular workers. The difference of 1.3 collateral visits in favor of the intensive group families was significant (Table IV-21).

There were no significant differences in the number of collateral visits made by the workers for families of children who received ERE training (Groups I and III) as compared to those in the control groups (Groups II and IV); the means were 1.1 and 0.8, respectively (Table IV-21). Also, there were no significant interactive effects in the number of collateral visits.

Office Visits

The number of office visits to see their caseworkers averaged

3.5 per family for those in the intensive groups (Groups I and II), compared to only 0.9 for those in the regular groups (Groups III and IV). The difference of 2.6 office visits was significant (Table IV-22). As with preceding measures, frequency of office visits also distinguished the two groups of families.

On the other hand, significant differences in the number of office visits were not found between the ERE (Groups I and III) and control families (Groups II and IV), nor were there any significant differences attributed to the interaction of treatment and training differences (Table IV-22).

Telephone Contacts

The number of telephone contacts between the workers and the families in Project Breakthrough is the final measure of quantitative differences in casework activities. The intensive casework families (Groups I and II) averaged 12.2 telephone contacts with their workers as compared to only 2.6 for the regular families (Groups III and IV). The difference of 9.6 telephone contacts in favor of the intensive group families was significant (Table IV-23).

It was also found that there were no significant differences in the average number of phone contacts made with their workers by the ERE (Groups I and III) and control families (Groups II and IV), nor were there any significant differences which arose through the interaction of training and treatment (Table IV-23).

Summary

The data reported in this chapter have shown that within the experimental group, the children receiving intensive services

(Group I) had more training time and more transfer sessions than did the children in the regular casework group (Group III). These differences constitute a potential bias when comparing the intensive and regular groups, but are of no consequence in ERE vs. control group comparisons.

It was also necessary to determine whether there were quantitative differences in the volume of social work services provided to the intensive (Groups I and II) and regular group families (Groups III and IV). The presence of such quantitative differences was clearly established in regard to all measures which were examined. The only bias found in this regard was the larger number of home visits made to Group I families which might increase the probability of an interactive effect being shown in the performance measures.

CHAPTER VIII

EXPERIMENTAL FINDINGS RELATING TO STANFORD-BINET INTELLIGENCE RATINGS

An intelligence rating was used as a control variable in the assignment of the children in matched pairs to the experimental and control groups in Project Breakthrough. The details of the matching procedure and the similarity of the four groups in regard to their Stanford-Binet intelligence scores were presented in earlier chapters of this report. This chapter will present data to show whether ERE training or intensive social work services produced measurable changes in the intelligence ratings of the children who participated in the project. The intelligence scores which function as criterion measures of the effectiveness of Project Breakthrough are those obtained by testing the children at the end of the study period. The final testing took place during August, 1967.

The Results of Training

At the end of the study period the 136 children included in the experiment obtained a mean IQ rating of 88.4 on the Stanford-Binet scale. The mean score for the children who received ERE training was 90.5 as compared to 86.4 for the children in the control groups: a difference of 4.1 IQ points. This difference was tested and found to be significant (Table IV-24).

In addition to the analysis of IQ ratings at the end of the project, the initial and final IQ scores of the children were compared in order to determine the extent and direction of change over the study period. From the beginning to the end of the project there was less than a one-point change in the mean IQ score for the total sample. The children who received ERE training showed a 1.1 point gain in IQ, but those who were assigned to the control groups experienced an IQ retrogression of 2.8 points.

INTELLIGENCE SCORE CHANGES BY TYPE OF TRAINING:
MEAN STANFORD-BINET SCORES

Study Groups	Pre-Test	Post-Test	Change
All Children	89.3	88.4	- 0.9
ERE Groups	89.4	90.5	+ 1.1
Control Groups	89.2	86.4	- 2.8
Difference	+ 0.2	+ 4.1	+ 3.9

While there was only a difference of 0.2 IQ points in favor of the ERE children's mean IQ score at the beginning of the project (and that difference was not significant), it had grown to 4.1 points when the children were tested at the end of the experiment. Subtraction of the very small difference in the initial mean scores results in a mean net difference of 3.9 IQ points in favor of the ERE children over the control group children. This mean net change also represents the difference between a mean increase of 1.1 IQ points for the ERE children and a mean loss of 2.8 IQ points by the control group children. When these two means were compared statistically, it was found that the difference of 3.9 IQ points in favor of the ERE groups over the control groups was highly significant (Table IV-25). It was therefore concluded that ERE training in Project Breakthrough did produce a difference in IQ ratings in favor of the ERE groups.

A difference of 3.9 IQ points is an important finding, but the nature and magnitude of the changes among the groups are of equal importance since this information reveals a great deal about the children under study. These data strongly suggest that pre-school age children from an impoverished background suffer serious retrogression in intelligence ratings as shown by a mean loss of 2.8 IQ points per child by the control group children.

Since intelligence scores are computed by dividing a "mental age" rating by the person's chronological age, it seems clear that IQ retrogression occurs because the "mental age" function of normal growth and development slows down or stabilizes over time for these children. This is a normal process for persons approaching adolescence and adulthood. But if "mental age" stabilization has begun before the child reaches the age of six, he will not be able to compete with his more advantaged counterparts during his early school years. The disadvantaged child may easily fall behind others in his class and then drop out of school when he reaches the adolescent years.

The major importance of ERE training may not be the increase of 1.1 IQ points for the children who received training, but the ability of this training to prevent IQ retrogression among very young children whose parents receive public aid and reside in a socially and economically depleted environment. This is not to minimize the IQ gains, for it seems that IQ retrogression may have begun before the children came to Project Breakthrough and even small IQ gains will help to compensate for these early losses.[1]

It may seem that a mean net gain of 3.9 IQ points by the ERE children over those in the control groups is small, but this must be weighed in relation to the amount of time actually spent in training. The 68 children who received ERE training averaged only 12.7 hours per child over the course of the entire project. The mean training time was 14.0 hours for children in Group I and 11.3 hours for those in Group III. This is clearly not a great deal of training time, but it has produced the IQ differences shown above.

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[1] Earlier retrogression is suggested by the fact that not one of the four groups obtained a mean IQ rating which fell in the normal IQ range of 90-110.

It can be argued that time spent in ERE training is not an effective measure of training time since the children also spent time in the transfer sessions and in the nursery. This research design did not include provisions for evaluating the respective contributions of ERE training, transfer sessions, and nursery experience separately, but it should be noted that each day the child spent only one and a half hours at the project site. Thus, hasty conclusions regarding the impact of a nursery experience of such short duration should be avoided in the absence of hard facts.

In relation to nursery experiences it is recalled that a much larger proportion of the control group children had experience in another pre-school program at the beginning of this project than had the ERE children. In spite of this difference, the ERE children did better on the Stanford-Binet Intelligence Scale at the end of the project. As noted in Chapter V, almost half of the control group children had taken part in Headstart or other pre-school programs, but only about a fifth of the ERE children had such experience. Most of these other pre-school programs have training sessions of greater duration than those provided by Project Breakthrough.

In Chapter V of this report a significant difference was reported between the ERE and control groups with respect to sex composition. Since there were more boys in the ERE groups, it was necessary to determine whether boys were better able to perform on the Stanford-Binet test and thereby account for the IQ differences between the two groups. In other words, if boys are better able to perform on the Binet scale than girls at this age, the differences in mean IQ scores might be attributed to sex differences rather than ERE training.

It was felt that differences in performance on the Binet scale for boys and girls could be best evaluated by comparing the IQ changes for the control group boys with those for the girls. In this way, IQ performance was compared without the influence of training differences. If significant changes were found in favor of better performance by the boys, evidence would be available to suspect that the sex differences between the groups contributed to the IQ differences noted above. The control group boys demonstrated a mean loss of 3.7 IQ points, compared to a mean loss of 2.2 IQ points for the girls in the control groups. This was a difference of 1.5 IQ points between the control group boys and girls, and this difference was not significant (Table IV-26). It was therefore concluded that the sex differences between the groups could not account for the significant IQ changes which occurred in favor of the ERE groups.

The Results of Treatment

One of the research questions posed for this study was whether the provision of intensive social work services would enable the students to take full advantage of the training opportunities provided. It was hypothesized that such would be the case, and it was therefore expected that the students who received intensive social work services would obtain better ratings at the end of the project. This did not occur in regard to the Stanford-Binet IQ scores. At the end of the project the mean IQ scores were 87.6 for those students who received intensive services, as compared to 89.3 for those who received regular services. This difference of 1.7 IQ points was not in the predicted direction, and it was therefore concluded that intensive services did not effectively influence the Binet scores (Table IV-24).

Similarly, there were very small differences between the intensive and regular groups in regard to the changes in IQ scores. The children whose families received intensive social work services lost, on the average, 1.3 points, as compared to an average loss of 0.4 points by the children whose families received regular services. The difference of 0.9 points in mean IQ changes was not in the predicted direction, and it was therefore concluded that intensive services did not effectively influence changes in the Binet scores (Table IV-25).

The Interaction of Training and Treatment

In addition to testing the separate effects of ERE training and intensive social work services, it was predicted that a significant interaction would occur between these variables. It was expected that the children in Group I would achieve a higher mean increase on the Stanford-Binet test than those who received regular social work services (Group III). On the other hand, in this hypothesis, it was felt that treatment differences alone would not have a significant impact upon the intellectual skills measured by the Binet test. Thus, it was predicted that the two control groups would demonstrate essentially the same performance in terms of IQ change.

The findings are shown first for the ERE groups (Table IV-25). Those who received intensive social work services (Group I) achieved a mean increase of 0.8 IQ points on the Binet scale as compared to a 1.4 point increase by those who received regular services (Group III). This finding clearly refutes the prediction of expected performance for the ERE children and is alone sufficient to reject the hypothesized interaction. However, for those interested in the control group performance, it is noted that the Group II children who received intensive services sustained a mean loss of 3.4 points as compared to a mean loss of 2.2 IQ points by those who received regular services (Group IV).

The Effect of Family Functioning

As noted in Chapter III it was felt that family functioning differences might affect the children's performance on the Stanford-Binet scale. It was thought that a high degree of family dysfunction at the beginning of the project would tend to inhibit the child's progress, and that this inhibiting effect would reveal itself through very small gains in Binet IQ scores. If this were true, removal of the effect of FFI pre-test raw scores would improve the significance levels of the differences in Binet IQ changes.

In order to evaluate the effect of pre-test FFI ratings on the Binet IQ changes, the design was expanded to a three-way analysis of variance. In doing so it was found that pre-test FFI ratings had no appreciable effect upon the changes in IQ scores. The results are not discussed in detail within this chapter, but the complete analysis is reported in Appendix V. Thus, for the purposes of this study it was concluded that differences in the level of family functioning as measured by the Family Functioning Instrument did not influence the children's performance on the Binet test in regard to changes in IQ scores.

Summary

On the basis of the data provided in this chapter, the following specific conclusions are set forth:

1. The provision of ERE training to pre-school children whose parents received public aid in Cook County, Illinois produced a gain of 3.9 IQ points over their control counterparts;
2. The IQ gain of 3.9 points for the experimental children was in addition to any gains arising through age, sex, maturational, and socio-economic differences among the children;
3. The conduct and evaluation of Project Breakthrough have identified a serious problem of IQ retrogression among pre-school children of public aid families in Cook County, but have demonstrated that training with the Edison Responsive Environment Talking Typewriter in an autotelic responsive environment markedly curtails the extent of that retrogression;
4. The ERE training produced significant IQ gains over the control groups even though the trainees were compared with more sophisticated control group children who had participated in other training programs prior to enrollment in Project Breakthrough;
5. The provision of intensive social work services, as defined in this project, did not have a measurable effect upon IQ gains obtained from the Stanford-Binet scale;
6. The provision of intensive social work services and ERE training did not produce a measurable interaction such that the combined effects of these two variables resulted in IQ changes in the predicted direction;
7. The differences in IQ gains between the ERE and control groups could not be attributed to the significant differences in sex composition; and
8. The initial functioning levels of the families in the study had no significant impact upon the changes in Binet IQ scores of the children.

CHAPTER IX

EXPERIMENTAL FINDINGS RELATING TO THE PEABODY PICTURE VOCABULARY TEST SCORES

The Peabody Picture Vocabulary Test was administered to the children in both the experimental and control groups in Project Breakthrough, but only at the end of the study period. Since pre-test scores were unavailable, it was not possible to report measures of change over the period of the experiment as was done with the Stanford-Binet scores. However, it is desirable to evaluate the children's final Peabody performance in relation to differences in training, social work services, and their interaction.

Before presenting the findings, it is important to note that the absence of pre-test scores raises the question of whether the four study groups are really comparable in regard to their performance on the test at the end of the experiment. If the children who received no training, for example, obtained a mean score that was much larger than that for the groups who received training, it might be concluded that the training had no noticeable effect. On the other hand, it is possible that the control groups were in a more advantaged position at the time the experiment began. If pre-test conditions were known, the training effect could be more fairly evaluated. The same problem occurs with the possibility that training might be evaluated as being effective in raising scores when in fact the scores were not raised at all; i.e., the scores at the end of the study were largely determined by an initial advantage.

The above discussion may suggest that it is impossible to draw any valid conclusions from the post-test Peabody scores alone. Actually, there is very good reason to believe that the four study groups were indeed comparable even in the absence of any pre-test data for the Peabody test. First, it should be noted that the four groups were remarkably similar with respect to more than twenty-five different control variables. That is, they were alike in regard to average age, parental education, economic circumstance, size of family, sibling order, etc. In addition, they were found to be alike at the start of the experiment, within the limits of chance variation, with respect to other important study variables such as IQ ratings, reading readiness scores, ratings of social maturity, and family functioning capacity. (A pre-test IQ difference favoring the regular social work groups will be accounted for through statistical adjustments.)

More important than the similarity of the groups with respect to other key variables is the fact that, through the analysis of covariance, an assessment of initial performance can be taken into account in interpreting the final Peabody scores. By using the children's pre-test Binet IQ scores as a covariate, it is possible to "adjust" the Peabody results by standardizing initial Binet performance. The effectiveness of the covariance analysis depends on the strength of the relationship between the two sets of scores. If subsequently that patterning proves to be weak or non-existent, the "adjustment" of the Peabody results is in turn negligible, but nothing save effort is lost.

In light of the remarkable similarity of the study groups in relation to so many different variables brought under scrutiny and the availability of data with which to conduct a covariance adjustment of the post-test scores, it is asserted that valid conclusions can be drawn with respect to the effects of training and social work service differences as related to group differences in the post-test Peabody scores. In presenting the findings on the Peabody test, only the "adjusted" mean scores for the study groups will be reported. Further details concerning the covariance analysis have been reported in Appendix V.

The Results of Training

At the end of the experiment the children who received ERE training (Groups I and III) obtained a mean score of 70.2 on the Peabody Picture Vocabulary Test as compared to 63.5 for those in the control groups (Groups II and IV). These scores are based on the test results obtained for only 64 of the children who received ERE training and 64 who were in the control groups. Two students in each of the four groups were excluded from this portion of the study analysis because they were not tested at the close of the project.

When the scores on the Peabody test were compared statistically, it was found that the difference of 6.7 points favoring the ERE groups was significant (Table IV-27). A difference of this magnitude occurs by chance alone only about 25 times out of one thousand.

The Results of Treatment

The results on the Peabody test were also compared under the two conditions of social work treatment. At the end of the study period the children in the intensive social work service groups (Groups I and II) obtained a mean Peabody score of 70.4 as compared to a mean score of 63.3 for the regular service group children (Groups II and IV). The difference of 7.1 points favoring the intensive social work service groups was found to

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be significant (Table IV-27). The likelihood of finding differences this large is less than 25 times out of one thousand.

The Interaction of Training and Treatment

One of the hypotheses tested in this experiment was that a significant interaction would occur between the training and the treatment variables. It was thought that the two control groups (Groups II and IV) would achieve approximately the same mean scores on the Peabody test, and that the two ERE groups (Groups I and III) would not. It was further predicted that the Group I children who received both ERE training and intensive social work services would achieve higher Peabody scores than would the children in Group III who received ERE training and regular social work services.

The interaction effect was examined by first comparing the performance of the children in the control groups. Those who received intensive services (Group II) obtained a mean Peabody score of 67.1 as compared to 59.9 by those who received regular services (Group IV). This was a difference of 7.2 points in favor of the intensive group children who received no training.

The second step in evaluating the interaction of training and treatment differences was to compare the groups who received ERE training. Those who received intensive social work services (Group I) obtained a mean score of 73.8 as compared to 66.7 by those who received regular services (Group III). This was a difference of 7.1 in favor of the intensive group children who received ERE training. Thus, it is seen that the difference of 7.1 favoring the ERE-intensive group and the difference of 7.2 favoring the control-intensive group were very similar, and there is little evidence from inspection of the mean scores that the interaction hypothesis was supported. When these differences were tested statistically, they were found to be not significant (Table IV-27). The null hypothesis of "no interaction between training and social work services" could not be rejected.

The Effect of Sex Differences

As in the case of the Stanford-Binet scores, it was necessary to determine whether differences in sex composition between the study groups constituted a bias in the Peabody scores. Since pre-test scores were not obtained, it was not possible to determine whether boys or girls had a pre-experiment advantage. When the results were compared for boys and girls in the control groups at the end of the project, it was found that the boys' average was 10.4 points (unadjusted scores) higher than the girls', but this difference was not significant (Table IV-28).

Since pre-test performance on the Binet test for boys and girls showed that sex differences between the groups could not account for or "explain" the experimental findings, and since there were no significant control group differences by sex at the end of the project with respect to the Peabody scores, there is no evidence to indicate that sex differences can account for the Peabody findings.

The Effect of Family Functioning

As with the change scores on the Binet IQ test, it was found that pre-test differences among the four groups with respect to ratings on the Family Functioning Instrument had no appreciable effect on the post-test Peabody scores. The details of that analysis are shown in Appendix V. It is sufficient to note here that pre-test family functioning capacity as measured by the Family Functioning Instrument was not an important factor in this experiment in relation to the Peabody test results.

Summary

In the absence of pre-test Peabody scores, it was necessary to utilize an expanded research design in order to obtain clear interpretations of the findings. The following specific conclusions are set forth as a summary of the findings reported in this chapter:

1. Given the similarity of the four study groups with respect to a large number of control and criterion variables at the beginning of the experiment and the ability to adjust the data for pre-test differences in Peabody skills through covariance analysis, it was concluded that the four groups of children were comparable with respect to their performance on the Peabody test at the end of the experiment;
2. Pre-school children in public assistance families who were exposed to the Edison Responsive Environment Talking Typewriter under an autotelic responsive environment system of training achieved significantly higher scores on the Peabody Picture Vocabulary Test at the end of the project than did their control counterparts who received no training;
3. The provision of intensive social work services to the families of the children enabled the participants to obtain higher mean Peabody scores at the end of the experiment as compared to a similar group of children whose families received regular social work services provided to families by the Cook County Department of Public Aid;

4. The provision of intensive social work services and ERE training did not produce a measurable interaction such that the combined effects of these two variables resulted in differences on the Peabody test in the predicted direction;
5. The difference in the Peabody scores between the ERE and control groups could not be attributed to a significant difference in the sex composition of the study groups; and
6. The initial functioning level of the families in the study, as measured by the Family Functioning Instrument, had no significant impact upon the Peabody scores at the end of the experiment.

CHAPTER X

EXPERIMENTAL FINDINGS RELATING TO THE METROPOLITAN READINESS TEST SCORES

The response of the children on the Metropolitan Readiness Test represents one of the most important measures of progress in Project Breakthrough. This test provides the most direct measure of reading skills used in the study, and the results of this test will therefore be of major importance to the evaluation of the project. The data presented in this chapter are especially important as they show the extent to which the project helped to close the gap between the deprived pre-school child and more advantaged children in regard to their respective exposures to learning tasks and reading and language development in the home.

While complete pre-test data were not available for the Metropolitan test, it was shown in Chapter VI that the children in the study groups were sufficiently similar in regard to reading readiness skills to conclude that post-test results would reflect the effects of the training efforts and the provision of intensive social work services. In addition, as was done for the Binet and Peabody tests, an effort was made to determine the effect upon performance of differences in ratings on the Family Functioning Instrument. Because that portion of the study showed the FFI pre-test ratings to have no appreciable effect upon the Metropolitan scores, the results are not discussed within this chapter. It is sufficient to note that pretest levels of family functioning capacity, as measured by the

Family Functioning Instrument, were of little consequence in the performance of the children on the Metropolitan test. The technical details have been reported in Appendix V.

Even though the children were closely matched on pre-test Binet IQ scores, it was found that the very small differences in the children's intelligence ratings at the beginning of the experiment did have an influence upon the scores they obtained on the Metropolitan test at the end of the study period. The effects of pre-test IQ differences were isolated and eliminated from the mean Metropolitan scores for the four study groups through an analysis of covariance, and the details of the analysis have been reported in Appendix V. Thus, the actual mean scores on the Metropolitan test are not shown here. Rather, the scores which would have been obtained without the effect of IQ differences among the children are the ones discussed below.

The Results of Training

At the end of the project study period, the 136 children obtained a mean Metropolitan score of 21.9 as compared to the mean of 15.8 for the 41 children tested at the beginning of the project: a difference of 6.1 points. The 68 children who received ERE training (Groups I and III) had a mean score of 24.0 on the Metropolitan test at the end of the study period as compared to 19.8 by those who were in the control groups (Groups II and IV). The difference of 4.2 points was highly significant and would occur by chance alone about 25 times in 10,000 (Table IV-29). Thus, the average score for the ERE groups was higher than that for the control groups by 21.2 percent.

If the mean score of 15.8 for the 41 pre-tested children is used as a benchmark, it is seen that the children who received

ERE training sustained a mean gain of 8.2 points on the Metropolitan test, but those in the control groups gained an average of 4.0 points. That is, the gain from the benchmark for the ERE children was more than twice that of the control group children.

Very little is known regarding the performance of children in this age group on the Metropolitan Readiness Test. It is possible, however, to compare these performances with those of beginning first-graders who constitute the national standardization group. This was done in Chapter VI when it was shown that the pre-test average score of 15.8 was equivalent to a percentile rank score of 2.0. By comparison, the ERE group mean score of 24.0 at the end of the study period is equivalent to a beginning first-grade percentile rank score of 7.0, while the percentile rank equivalent for the control group mean of 19.8 is only 4.0. This represents a difference of 3.0 points in first-grader percentile rank scores in favor of the ERE groups. By comparison with the pre-test benchmark, the ERE groups showed a gain of 5.0 percentile rank points as compared to 2.0 by the control groups.

According to the direction manual for the Metropolitan Readiness Test, performance predictions are made in relation to the quality of first-grade work for various scoring ranges. First-grade children scoring below 24 on the Metropolitan test are predicted to perform as follows: "Chances of difficulty high under ordinary instructional conditions. Further readiness work, assignment to slow sections, or individualized work is essential."[1] The 41 children who were tested at the beginning of the project and the 68 children in the control groups who were tested at the end of the project clearly fell into this category of performance expectations.

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[1] Gertrude H. Hildreth, Nellie L. Griffiths, and Mary E. McGauvran, Manual of Directions: Metropolitan Readiness Tests (n.p.: Harcourt, Brace & World, Inc., 1966), p. 8.

Though the children in the control groups at the end of the project fell solidly within the low readiness status category (below 24), the children in the ERE groups were borderline between the low readiness status and the low normal range (24 to 44). The mean score of 24.0 indicates that the ERE children were probably able, as a group, to complete first-grade work, but the performance prediction shows they are: "Likely to have difficulty in first-grade work. Should be assigned to slow section and given more individualized help."[1] In other words, the 68 children who received ERE training were only 4.9 years of age on the average, but they were able to function at a low-normal level in relation to performance criteria established for beginning first-graders who are estimated to have an average age of 6.3 years. If confronted with first-grade work at the end of Project Breakthrough, these children would undoubtedly have some difficulty, but the evidence presented indicates that these children were approaching first-grade work even prior to enrollment in kindergarten.

Sub-Sample Training Results

While the major content of this study focuses upon the performance of the 136 children in the experimental and control groups of Project Breakthrough, there were 11 children in the experimental groups who were pre-tested at the end of October, 1966 and who continued participation in Project Breakthrough beyond the study period which terminated in August, 1967. The performance results of these children on the Metropolitan Readiness Test provide additional information over a much longer period of time. The following data are based on actual scores; no adjustment was made for IQ differences.

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[1] *Ibid.*

The 11 children in the sub-sample obtained a mean score of 15.9 on the Metropolitan Readiness Test when they were pre-tested during October, 1966 (Table IV-30).[1] They were again tested during July, 1967, approximately nine months later, and their reading readiness scores had climbed to an average of 20.7. These scores are very similar to those obtained by the larger study group, but 3.3 points lower than the post-test mean score for the 68 children in the ERE groups. However, when the 11 children who continued in the project were last tested during June, 1968, it was found that their mean score on the Metropolitan test had risen to 33.7. Thus, after almost 20 months from pre-test and after 17 months of actual participation in Project Breakthrough, these children had more than doubled their pre-test raw scores.

While these 11 children are still within the "low normal" range of performance expectations in relation to beginning first-grade work, they can no longer be described as borderline between the low and low normal categories. They have been elevated to the middle of the low normal scoring range of 24 to 44.

Of the 11 children, two showed little or no progress over the entire period of their participation in the project. Both of these students remained in the low status scoring range in regard to first-grade performance expectations. A third student was also classified as a low status performer even though he had nearly doubled his original Metropolitan score. Five other students fell within the low normal category with scores ranging from 29 to 44. Two of the remaining three students were borderline average in regard to beginning first-grade performance expectations; both had a score of 45 on the Metropolitan test. The highest scoring student obtained a score of 49 which placed him in the average scoring range of 45 to 63. The performance prediction for these three students is as follows: "Likely to succeed in first-grade work. Careful study should be made of the specific strengths and weaknesses of pupils in this group and their instruction planned accordingly."[1]

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[1] While all 11 children were pre-tested on the same October date, five did not actually begin training until March 27, 1967. This accounts for the time difference between test dates and months of participation.

Upon enrollment in the project the children were 3.7 years of age on the average and had a mean Metropolitan score of 15.9. However, when they were tested on June 12, 1968, they were, on the average, 5.1 years of age, had participated in the project about 17 months, and obtained an average raw score of 33.7 on the Metropolitan test. This group of children was readied for first-grade work at a low normal level by the time they were preparing to enter the kindergarten classes in the Chicago school system. It should be noted that the difference of 4.8 points from pre-test to mid-test was not significant, but the difference of 13.0 points from mid-test to post-test was highly significant (Table IV-30). As noted earlier, the children were in training about six months when they showed a 4.8 point gain and had an additional eleven months of participation when they showed a 13.0 point gain over the mid-test scores.

The Results of Treatment

Evidence was obtained to indicate that differences in social work services resulted in significant differences in the children's scores on the Metropolitan Readiness Test. The 68 children who received intensive social work services (Groups I and II) obtained a mean score of 23.2 on the Metropolitan test as compared to 20.6 for the children who received regular social work services (Groups III and IV). The difference of 2.6 points in favor of the intensive group children was significant (Table IV-29).

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[1] Hildreth, Griffiths, and McGauvran, Manual of Directions, p. 8.

As indicated earlier in this chapter, the above mean scores are those which were obtained after the effects of differences in IQ ratings were removed. By removing the effects of IQ differences among the children in the four study groups, it was possible to obtain a more accurate measure of performance on the Metropolitan test. In other words, even though the children were rather closely matched in regard to their IQ scores at the beginning of the experiment, the very small differences in IQ resulting from an imperfect match were nonetheless large enough to create a definite bias in the results. When that source of bias was unaccounted for, it was not possible to clearly see the effect of differences in social work services upon the children's performance on the Metropolitan test.

The Interaction of Training and Treatment

The interaction hypothesis stipulated that the children in the two control groups would perform at about the same level in regard to their scores on the Metropolitan test, but the two ERE groups would show differences in favor of the children who received intensive social work services. The control groups are examined first (Table IV-29). The 34 children who received intensive services (Group II) obtained a mean score of 20.3 on the Metropolitan test as compared to 19.3 for those who received regular services (Group IV). This small difference of 1.0 point adds support to part of the interaction hypothesis, i.e., that these two groups would obtain similar scores.

The two ERE groups demonstrated a slightly different performance. The 34 children who received intensive social work services (Group I) obtained a mean score of 26.0 on the Metropolitan test as compared to 22.0 by those who received regular social work services (Group III). This is a difference of 4.0 points in the mean scores in favor of the Group I children who received intensive services. The difference in the mean scores appeared to support the interaction hypothesis, but when tested it was found to be not significant (Table IV-29). The null hypothesis of "no interaction between training and treatment" cannot therefore be rejected.

The Effect of Sex Differences

The children's reading performance on the Metropolitan test was evaluated to determine whether differences in sex composition of the groups might constitute a bias in the results. The scores for the boys in the control groups averaged 18.7 while the girls had an average score of 20.4. The difference of 1.7 points in the two mean scores was not significant (Table IV-31). These data contain no evidence to indicate that the performance differences attributed to training and treatment were instead due to differences in the sex composition of the study groups.

Summary

As a summary of the findings presented in this chapter, the following conclusions are set forth:

1. A group of pre-school children of public assistance families, who were given eight months of training on the Edison Responsive Environment Talking Typewriter under an autotelic responsive environment system, demonstrated significantly higher scores on the Metropolitan Readiness Test over their control group counterparts who received no training;

2. The training given to the experimental group children provided them with reading readiness skills sufficient to cope with first-grade materials (albeit at a low level) at an age when they were entering kindergarten, whereas the children who received no training would have extreme difficulty with first-grade reading materials;
3. A sub-group of 11 children, who received ERE training for approximately 17 months, more than doubled their Metropolitan scores and were, at beginning kindergarten age, capable of "low normal" performance in first-grade work;
4. The provision of intensive social work services had a significant impact upon the performance of the children on the Metropolitan Readiness Test such that those who received intensive services obtained higher mean scores than those who received only regular social work services;
5. Under the conditions of this experiment no evidence was obtained to indicate that training and treatment differences interacted to produce significant differences in the mean scores obtained on the Metropolitan Readiness Test;
6. Under the conditions of this experiment no evidence was obtained to indicate that pre-test ratings on the Family Functioning Instrument were significantly related to the differences in performance of the four study groups on the Metropolitan Readiness Test; and
7. Evidence was obtained to show that pretest IQ scores on the Binet scale were significantly related to performance on the Metropolitan test, and experimental effects may not be demonstrated if this relationship is not accounted for.

CHAPTER XI

EXPERIMENTAL FINDINGS RELATING TO THE VINELAND SOCIAL MATURITY SCORES

The findings presented in the previous chapters in relation to IQ and reading readiness scores represent primarily the effects of Project Breakthrough in modifying the children's preparedness for entry into a formal school setting. More importantly, the criterion measures discussed earlier were used to assess the children's ability to cope with reading and instructional materials. They do not show the extent to which the children grew and progressed as social beings.

As outlined in Chapter III, the Vineland test was used mainly as a control device in evaluating the similarity of the four groups of children. However, it was thought that Project Breakthrough might function as a significant force in modifying the level of social maturity of the children. The potential for the experiment to operate as such an influence was seen through the impact of the nursery experience and the provision of intensive social work services to the families. The children attended the project on a daily basis and therefore had an increased opportunity for social contact with children and adults outside their neighborhood. All of the children were exposed, perhaps for the first time, to group activities, a need for greater self-reliance, and a broader range of opportunities to explore a larger environment.

In addition, the provision of intensive social work services might have some influence upon the social maturity of the children by assisting the parents (in most cases, the mother) to understand and support their children's efforts in the project. When a parent felt concern over what she thought was evidence of slow progress, the caseworker had an opportunity to interpret project goals and thereby reduce to some extent the parent's anxieties. The caseworker was also in a position to encourage attendance, discuss the child's fears or disappointments, and strengthen the families' efforts to cope with a new routine in their daily activities.

The scores on the Vineland test were therefore used as a criterion measure to determine whether the project had any effect upon the children's social growth and development. In constructing the criterion measure, the Vineland pre-test score for each child was subtracted from his post-test score in order to obtain a measure of change in social maturity. The change scores were then subjected to a detailed analysis. The findings presented in this chapter are based upon the results of 31 change scores for each of the four study groups. Three participants from each of the groups were excluded from the analysis because of missing post-test scores. The technical details of the statistical analysis are reported in Appendix V.

Pre-test ratings of family functioning capacity were examined to determine whether differences in levels of functioning capacity had an influence upon the change scores achieved by the children on the Vineland test. Once again it was found that the pre-test FFI ratings had no appreciable effect upon the children's Vineland performance. (The details of that analysis are reported in Appendix V.) It is therefore sufficient to note that differences in family functioning capacity at the beginning of the experiment, as measured by the Family

Functioning Instrument, were not an important consideration in the examination of results obtained on the Vineland Social Maturity Scale.

As with the Peabody and Metropolitan scores, an analysis of covariance was conducted to account for the effect of pre-test IQ differences upon the children's Vineland performance. There was a significant relationship between the initial IQ measures and the Vineland change scores which suggests that these changes were in part determined by the child's ability to perform on the Stanford-Binet test. The covariance analysis provided a method for eliminating this effect upon the Vineland results. Thus, the Vineland change scores were adjusted by using the Binet pre-test scores as a covariate. Only the adjusted scores are discussed in this chapter in order that a clearer evaluation of the effects of training and social work treatment differences can be presented. The details of the covariance analysis are shown in Appendix V.

The Results of Training

The 124 children included in this analysis obtained an average increase of 0.7 points on the Vineland test over the course of the study period. Of those who received ERE training (Groups I and III), the average increase was 0.8 as compared to 0.7 for those in the control groups (Groups II and IV). When these average change scores representing a difference of 0.1 points in favor of the ERE groups were tested, the difference was found to be not significant (Table IV-32).

The Results of Treatment

The 62 children in this analysis whose families received intensive social work services (Groups I and II) obtained a mean gain of 0.6 points on the Vineland test as compared to 0.9 by the children whose families were exposed to regular social work services provided to families receiving public assistance in Cook County, Illinois (Groups III and IV). Since it was predicted that the intensive group children would show a larger gain than the regular service groups, the larger gain by the regular groups (a difference of 0.3 points in their favor) is alone sufficient to discount the effect of social work service differences upon changes in Vineland performance (Table IV-32).

The Interaction of Training and Treatment

The interaction hypothesis tested with the Vineland change scores was the same as for previous measures: that the two control groups would achieve about the same results, but that the ERE-intensive group would exceed the ERE-regular group with respect to changes on the Vineland test. The control-intensive group (Group II) showed a mean gain of 0.6 points as compared to 0.7 by the control-regular group (Group IV). This similarity in mean scores tends to support one part of the interaction hypothesis. However, the ERE-regular group (Group III) obtained a mean change of 1.0 point as compared to only 0.5 by the ERE-intensive group (Group I). This finding contradicts the prediction stated above and is sufficient to discount the experimental hypothesis.

Summary

The following specific conclusions are set forth as a summary of the findings presented in this chapter:

1. The provision of ERE training to a group of pre-school children whose parents received public assistance in Cook County, Illinois did not produce a significantly

greater increase in scores on the Vineland Social Maturity Scale as compared with their control group counterparts;

2. The provision of intensive social work services, as defined in this project, had no measurable effect in producing greater gains on the Vineland Social Maturity Scale as compared with the gains made by similar groups of children who received only regular social work services; and

3. The provision of intensive social work services and ERE training did not produce a measurable interaction such that the combined effects of these two variables resulted in changes in social maturity ratings in the predicted direction.

CHAPTER XII

EXPERIMENTAL FINDINGS RELATING TO THE FAMILY FUNCTIONING SCORES

The Family Functioning Instrument, as discussed previously, represents an effort to measure the capacity of the participants' families in coping with the normal daily tasks of managing a home, caring for a family, and utilizing adult skills and abilities to maximize the growth potential of each family member. The use of the Family Functioning Instrument in previous sections of this report has been restricted to the role of a pre-test diagnostic instrument. In that context, pre-test scores on the Family Functioning Instrument (FFI) served as a control variable to eliminate any effect of differences in family functioning capacity upon the children's performance in the project.

In this chapter the raw scores on the FFI will be used as a criterion variable. At the end of the project the intensive and regular caseworkers were asked to rate the families again. The pre-test and post-test scores were then compared, and by subtracting one from the other, a measure of change in family capacity was obtained. The change scores were then compared for the four study groups to determine whether differences in training and social work services were associated with growth or decline in rated functioning capacity. Actually, it was thought that differences in training would not have a significant impact upon the FFI ratings, but the effect of training differences was isolated as a control measure. In addition, the Binet IQ pre-test scores were also used as a control variant in relation to changes in FFI ratings.

The Results of Training

Both the experimental and control groups had a mean gain of 0.3 points in FFI scores (Table IV-33). On the basis of this finding, it was concluded that the provision of ERE training to the children in the project had no material effect upon the functioning capacity of their families.

The Results of Treatment

The possibility of intensive social work services having a measurable effect upon intellect in this project was conceded from the outset to be quite remote, and especially so when these services were to be provided for such a short period of time. While the criterion measures used to assess intellectual gains cannot be regarded as adequate measures of the effect of differences in social work services, the change scores on the FFI should provide a more direct measure of these differences.

In using the change scores on the FFI as a criterion measure of the effect of social work service differences, it was expected that the families who received intensive services would show the greater gains in score changes. It was also expected that these larger gains could arise from two primary sources: the true effect of service differences and spurious effects of rating bias.

At the beginning of the experiment the intensive workers knew that one of the project goals was to determine whether provision of intensive social work services would prove to be effective in aiding the children (through work with their families) to extract maximum benefit from the project experience.

Since these caseworkers were aware of this goal from the beginning, it is possible that they showed rating changes, albeit not deliberately, which would tend to "prove" the value of intensive services. Unfortunately, administrative requirements for the project made it impossible to experimentally control for this possible source of bias. Even in the absence of a rating bias, it is possible that the four intensive workers performed, as judges, in a manner which was characteristically different from the regular workers.

Since the research design did not include a systematic investigation of rating bias, an effort was made to account for this problem by establishing hypotheses which, if supported, would indicate the presence of rating biases at the end of the experiment. Then, if these hypotheses could not be supported, the use of these data would be strengthened.

Since the intensive caseworkers knew that their services were used in the project to promote greater learning gains for the children in Group I who received both intensive services and ERE training, it was felt that any bias would show up by overrating the families of the Group I children. If the intensive workers rendered biased judgments at the end of the experiment, the net difference in FFI change scores between Group I and Group III should be much larger than the net difference between Group II and Group IV. Such a finding would be demonstrated through a significant interaction and would suggest that rating biases were operating.

When the above hypothesis was tested, it was found that the interaction of social work services and training differences was not significant (Table IV-33). Thus, there was no evidence in favor of the presence of rating biases which would negate the findings of any differences in the effect of intensive versus regular social work services upon changes in the FFI scores.

While failure to demonstrate a significant interaction eliminates the notion of rating bias favoring the experimental objective, it does not eliminate the possibility that the two sets of judges (caseworkers) were themselves different with respect to their performance in assigning FFI ratings to the families. The caseworkers did perform in a very similar manner in providing initial ratings, as demonstrated by the similarity of pre-test mean FFI scores for the four groups (Table IV-15). It could be argued that the workers were, at the end of the experiment, rendering only a repetition of the same rating task (they were not asked to measure change in functioning capacity but functioning levels at two points in time), and that their performance on the post-test ratings would be consistent with their pre-test performance. The problem here is that intensive workers knew that pre-test and post-test scores would be compared, and this knowledge may have influenced their behavior. There is no way to be sure.

The main finding in regard to the effect of differences in social work services was that the families who received the intensive services obtained a mean gain of 0.5 points in Family Functioning Instrument ratings as compared to only 0.1 points by those who received the regular social work services. This represents a difference of 0.4 points in favor of the intensive service groups, and this difference was significant (Table IV-33). A difference this large could be expected on the basis of chance alone only about five times out of a thousand.

The Effect of Pre-Test IQ Differences

It was noted earlier in this report that IQ scores, for the purposes of this experiment, were not regarded simply as measures of innate intelligence. Rather, they were felt to be a measure of both the ability of the child, as a biological entity, to perform in the learning environment and the result of the child's exposure to his family, neighborhood, friends, and a poverty culture. It was therefore not known to what extent the child's IQ score represented the environment from which he came. For this reason the pre-test IQ scores were included as a control variable in the study of differences in social work treatment. It was found, however, that pre-test IQ differences had no substantial effect upon the changes in FFI ratings (Table IV-33).

Summary

The extent to which the families of the children in Project Breakthrough were shown to have improved their ratings on the Family Functioning Instrument has been the focus of this chapter. Primary interest centered on the question of whether intensive social work services were associated with larger gains in family functioning ratings, and an effort was made to account for the presence of rating biases on the part of the intensive caseworkers. No evidence was obtained to show that rating biases were present, but this does not exclude the possibility that a portion of the gains favoring the intensive service groups was spurious. It is doubtful, however, that rating biases (if present) could wholly account for the highly significant differences which were obtained. On the other hand, the weaknesses in experimental control over this variable mean that the data should be used primarily as background information for the planning of future research with more adequate experimental controls.

The following specific conclusions are set forth as a summary of the data presented in this chapter:

1. The provision of training to pre-school children of public aid families, with the use of the Edison Responsive Environment Talking Typewriter under an autotelic responsive environment system of training, had no effect on the elevation of family functioning capacity as measured by the Family Functioning Instrument;
2. The provision of intensive social work services to the families in Project Breakthrough resulted in significantly improved scores on the Family Functioning Instrument as compared to their control counterparts who received regular social work services, but the extent to which this finding represents gains in family functioning capacity or performance differences of the rating caseworkers remains uncertain; and
3. Pre-test IQ differences, as a measure of the influence of the environment from which the children came, had no measurable effect upon changes in family functioning capacity.

CHAPTER XIII

EXPERIMENTAL FINDINGS RELATING TO THE REAT PERFORMANCE RATINGS

In addition to the use of standardized tests in Project Breakthrough, the project staff developed a more direct measure of performance in the ERE sessions. Performance ratings of the children in the ERE sessions were obtained through a device known to the project as the Reading Elements Achievement Test (REAT). The REAT scale consisted of nine different achievement levels which were identified as:

1. Random Exploration
2. Systematic Exploration
3. Recognizes Shapes
4. Recognizes Letter Names
5. Knows Shapes and Sounds
6. Knows Upper-Case Letters
7. Knows Lower-Case Letters
8. Knows Phonetic Elements
9. Recognizes Sight Words

Throughout the project the booth attendants maintained daily records of the progress of each child in the training sessions. At the end of the project the booth attendants were asked to review each child's daily records and, on the basis of these documents, render an evaluation of the final standing of each child in the project. Further details regarding these final ratings were discussed in Chapter III.

A rating of seven meant that the child had progressed through the first six levels of performance and at the end of the project gave clear evidence that he knew many of the lower-case letters.

If a child received a performance rating of nine, this meant that he had progressed beyond a knowledge of the phonetic elements and demonstrated an ability to recognize many sight words at the time the project was terminated.

Since performance ratings were supplied only for the 68 children who received ERE training, it is not possible to make control group comparisons. However, the performance level ratings were compared according to the types of social work treatment and the pre-test ratings on the Family Functioning Instrument. The purpose of these comparisons was to determine whether the provision of intensive social work services and the functioning capacity of the family had an impact upon the ability of the children to perform on the REAT scale.

The 68 children in the study who received ERE training obtained a mean performance rating of 7.4. In terms of the scale definitions, this means that each child, on the average, was able to recognize and use letter shapes, sounds, and names for both upper- and lower-case letters. The performance level ratings ranged from a low of five to a high of nine. Thus, none of the children at the end of the study period were performing at the rudimentary level of letter shape and name recognition, and some of the children had acquired the ability to recognize sight words. Some of the children had actually acquired the fundamentals of elementary reading ability as reflected by reports summarizing their daily progress.

The Results of Treatment

The 34 children who were given intensive social work services (Group I) obtained a mean performance level rating on the REAT scale of 7.4 and the children whose families received regular social work services (Group III) obtained a mean REAT score of 7.3. The difference of 0.1 points between the two mean scores was not significant (Table IV-34). From these data it was concluded that differences only in social work treatment did not produce significant differences in the REAT performance ratings.

The Effect of Family Functioning

In this analysis the pre-test FFI scores were treated only as a control variable. However, the question as to whether FFI ratings at the beginning of the experiment were associated with scores on the REAT scale is an important one. The REAT scale represents the only direct measure of the children's performance in the project with respect to specified components of the language development process. The Binet, Peabody and Metropolitan scores were regarded as measures of growth in language development, but they all measure many other skills as well. The REAT scale, on the other hand, was designed as a direct measure of a sharply delimited number of specific skills with respect to the learning and handling of language elements which were defined at the beginning of this chapter. In controlling for the effect of pre-test FFI ratings it was found that FFI rating differences were associated with performance ratings on the REAT scale, and the differences attributed to FFI pre-test scores could have occurred by chance alone only about five times out of a thousand (Table IV-34). On the basis of these findings it was concluded that the level of functioning capacity of the family at the time the child begins a training program such as Project Breakthrough has an important bearing upon his progress in the learning tasks.

The above findings are based entirely upon the REAT scores obtained at the end of the experiment. The question naturally arises as to whether the children in the two groups possessed the same skill level when they began the experiment. An exact measure of pre-test REAT skills cannot be reported as REAT scores were not obtained at the beginning of the study. However, at the end of the study period the laboratory supervisors were asked to rate each child according to his initial ability to perform on each of the REAT elements numbered three through nine at the beginning of this chapter.

Inspection of the ratings of the children's ability to perform on the REAT scale at the beginning of the experiment revealed that every child was rated at 1.0 on every one of the seven elements. Thus, in the judgment of the laboratory supervisors, none of the children possessed the ability to recognize letter shapes or names when they entered the project; they had no knowledge of shapes, sounds, upper- or lower-case letters, or phonetic elements; and none were capable of sight recognition of words.

Summary

Data were not collected for the control group children in regard to performance level ratings on the REAT scale because the measurement device was specific to the training environment and the ERE training experience. Consequently, comparisons between groups according to training differences could not be made. However, performance differences were examined in relation to differences in social work services and pre-test family functioning capacity.

It was found that social work service differences had no significant impact upon the children's performance on the REAT scale. However, differences in family functioning capacity, as measured by the Family Functioning Instrument, were significantly related to the children's performance ratings.

The following specific conclusions are set forth as a summary of the data presented in this chapter:

1. The provision of intensive social work services did not produce significant gains in the children's scores on the Reading Elements Achievement Test as compared to those children whose families received only regular social work services;
2. Differences in the initial functioning capacity of the families did prove to have a significant effect upon the performance of the children on the Reading Elements Achievement Test; and
3. The laboratory supervisors' evaluations of the children's ability to perform on the REAT scale at the beginning of the experiment indicate that performance gains were not due to pretest knowledge of REAT components.

CHAPTER XIV

SUMMARY AND CONCLUSIONS

The Cook County Department of Public Aid began an educational program for very young children from families receiving assistance under the conviction that adult illiteracy might be prevented through intervention into the "cycle of poverty". The method of intervention was to provide a group of pre-school aged children with a training experience which would better prepare them for entry into a formal school setting, reduce the likelihood of their dropping out of school because they dropped behind in school, and thereby help them to function better when they reached adulthood.

In developing Project Breakthrough, the Department moved with caution because the appeal of electronic gadgetry is so great, and because many efforts to utilize electronic teaching devices have not always been thoroughly tested before developing new programs. After thorough investigation clearly indicated that utilization of the Edison Responsive Environment Talking Typewriter was warranted, the Department required for its own satisfaction that a research evaluation study become an integral part of all phases of program development. As the Office of Economic Opportunity was to be the funding agency, the Cook County Department of Public Aid wished to be in a position at the termination of the project to provide a sound evaluation of the final results with appropriate recommendations.

In light of the above considerations the Research and Statistics staff of the Department has subjected the data to stringent tests. However, the data have shown that the Edison Responsive Environment Talking Typewriter is by no means an implement of "electronic gadgetry". When coupled with the autotelic responsive environment system of training, the ERE equipment is seen as a highly sophisticated device which has functioned as a powerful aid in helping a group of very young children to rapidly enhance their ability to understand and manipulate their world in terms of symbolic language.

The research component of Project Breakthrough was conducted as a field experiment to determine whether the children who participated in the project showed greater progress and achievement in reading and language development than a sample of comparable children in control groups. The study also attempted to show whether the provision of intensive social work services was of benefit to the children in helping them to maximize their learning progress in the project.

The Research Hypotheses

In the first chapter of this report, the research problem was identified through the statement of four general hypotheses. These are restated and discussed at this time as a final summary of the study findings.

The Effect of ERE Training

> The children who received Edison Responsive Environment training (ERE) would, at the end of the project, demonstrate higher performance ratings on a variety of criterion measures than a group of similar children who received no training.

The Impact on Intelligence Ratings

The above hypothesis was accepted in regard to the children's performance on the Stanford-Binet Intelligence Scale and the

Peabody Picture Vocabulary Test. Thus, it was concluded that Project Breakthrough increased intelligence ratings among pre-school aged children of public assistance families in Cook County, Illinois. The observed increase in intelligence ratings has been attributed to the provision of training with the use of the Edison Responsive Environment Talking Typewriter under an autotelic responsive environment system of education.

The children who received ERE training sustained a mean gain of 1.1 points in Binet IQ scores while the control group children averaged a loss of 2.8 points. Thus, over the course of the experiment, ERE training produced an average net gain of nearly four IQ points on the Binet scale over the control groups. Similar results were obtained in regard to post-test scores on the Peabody scale. At the end of the experiment the children who received ERE training obtained a mean score of 70.2 as compared to 63.5 for the control groups: a difference of 6.7 points on the Peabody scale in favor of the ERE training. Both of these findings were highly significant.

The Impact on Reading Readiness

The above hypothesis was accepted in regard to the children's performance on the Metropolitan Readiness Test. At the end of the experiment the children who received ERE training obtained a mean score of 24.0 on the Metropolitan test as compared to 19.8 for the children in the control groups: a highly significant difference of 4.2 points in favor of ERE training. In addition, it was found that a sub-sample of eleven children was readied by ERE training, over a period of about 20 months, for performing first-grade work at a low normal level even prior to their entry into kindergarten.

On the basis of the above findings and appropriate statistical tests, it was concluded that Project Breakthrough increased reading readiness levels of pre-school aged children whose families received public assistance in Cook County, Illinois. The observed increase in reading readiness levels has also been attributed to ERE training under an autotelic responsive environment system.

The Impact on Reading Elements

The above hypothesis was neither accepted nor rejected in regard to the children's performance on the Reading Elements Achievement Test (REAT). The inability to state a definitive conclusion with respect to REAT performance arises from the absence of REAT ratings for the control group children and the consequent lack of a base for comparison.

It was observed, however, that the Reading Elements Achievement Test had a very high predictive validity coefficient, $r = .62$, in relation to the Metropolitan Readiness Test. This finding indicates that the REAT scale, developed by the Project Breakthrough staff as an experimental device, may have considerable merit as a new testing device for educators, provided it is further tested and modified for administration under a wider set of test conditions. As used in Project Breakthrough, however, the REAT scores obtained for the children who received ERE training indicate a relatively high level of achievement. That is, the mean rating for the children who received training was 7.4 on a nine-point scale. Translating this score into a scale definition indicates that each child, on the average, was able to recognize and use letter shapes, sounds, and names for both upper- and lower-case letters. The scores for the 68 children in the experimental groups ranged from a low of 5.0 to a high of 9.0. The lowest score of 5.0 means that all of the children, at the end of the study period, had progressed beyond the rudimentary level of letter shape and name recognition. On the other hand, the highest score of 9.0

indicates that some of the children had acquired the ability to recognize sight words and thereby demonstrated the acquisition of the fundamentals of elementary reading ability. While these statements represent scale interpretations of the REAT findings, they are to a considerable extent confirmed by the findings obtained from the Metropolitan Readiness Test discussed above.

The Impact on Social Maturity and Family Functioning Capacity

The above hypothesis was not accepted in regard to either the children's performance on the Vineland Social Maturity Scale or the ratings given to their families on the Family Functioning Instrument. As a statistical caution, the research staff have not accepted the null hypothesis of "no difference" with respect to these measures. To do so would be to assert that there is no relation between ERE training and changes on both the Vineland scale and the Family Functioning Instrument. Such a statement of "no difference" may, in a final analysis, be quite true, but sufficient information has not yet been obtained to warrant such a conclusion. The relation between ERE training and these two criterion measures has been examined only within a highly limited experimental space which encompassed a brief period of training and a select group of participants characterized by both their youth and their poverty. The best that can be said with reasonable certainty is that the evidence obtained in this study is not strong enough to assert a relationship between ERE training and changes on the Vineland Social Maturity Scale or the Family Functioning Instrument.

Study Limitations Regarding the Effect of ERE Training

Very strictly speaking, the findings of this study describe only the population represented by the study sample: children aged

3.0 to 5.5 years whose families (1) receive public assistance, (2) live within specified geographic areas of Cook County, Illinois, (3) voluntarily enroll their children in such a project, etc., etc. Generalizations beyond the limits of the experimental space represent a process of extrapolation to other populations. Actually, the research staff believe that a considerable degree of extrapolation can, and should, be made without violating the normal limits of good judgment. For instance, it is quite likely that very young children of poverty-ridden families, whether they are receiving public assistance or not, will profit extensively from a training program such as Project Breakthrough in nearly all of the major metropolitan areas of the United States. This especially if they are living in the black ghettos of the country's big cities.

On the other hand, the findings of this study cannot be generalized to families with higher levels of educational achievement, better incomes and job opportunities and who are residing in white neighborhoods with good or better housing conditions. Neither can the study findings be extrapolated to make extended predictions regarding growth in IQ scores, reading readiness elevation, or knowledge of reading elements. It is reasonable to expect that growth in such measures would begin to "peak out" or level off after an extended period of training, and when this occurs, it may be appropriate (and indeed necessary) to modify the training goals or terminate the project. Such choices would, of course, depend on the specific objectives of the program.

Before leaving the study limitations, it should be noted that a potentially strong bias was present throughout the conduct of Project Breakthrough. That is, the control groups (which received no training and were used as a base for comparison) were conceivably more sophisticated than the experimental groups by virtue of their having greater exposure to other pre-school programs, such as Project Headstart, both prior to and during the operation of Project Breakthrough. The presence of this control group advantage would tend to suppress the true differences in IQ ratings and reading readiness scores. A second limiting factor was the small amount of training given to the experimental groups: about 13 hours of exposure to ERE training for each child on the average. This was due primarily to the short daily periods of training and an absence rate of about 34 percent of total training sessions available. In light of these limiting factors, it is highly probable that the real effect of ERE training upon measured intelligence and reading readiness was even greater than that shown by this study.

The Effect of Social Work Services

> The children whose families received intensive social work services would, at the end of the project, demonstrate higher performance ratings on a variety of criterion measures than a group of similar children whose families received only the regular social work services.

The Impact on Intelligence Ratings

This hypothesis was accepted in regard to the children's performance on the Peabody Picture Vocabulary Test. The children whose families received intensive social work services obtained a mean Peabody score of 70.4 at the end of the experiment as compared to 63.3 for the children in the regular social work groups: a highly significant difference of 7.1 points in favor of intensive services. Thus, it was concluded that the provision of intensive social work services in Project Breakthrough was associated with improved intelligence ratings as measured by the Peabody Picture Vocabulary Test.

These findings are accepted as clear evidence that intensive social work services, as predicted, helped the children to maximize the learning opportunities afforded them through Project Breakthrough.

This hypothesis was not accepted in regard to the children's performance on the Stanford-Binet Intelligence Scale. The same statistical caution noted for the effect of ERE training in relation to changes on the social maturity and family functioning scales is injected here. That is, failure to accept this hypothesis does not require acceptance of the null hypothesis of "no difference" between intensive and regular social work services with respect to changes on the Binet scale. Because of the limiting conditions of the experimental space, it is felt that sufficient information has not been obtained to justify the conclusion that there is no relationship between social work service differences and changes on the Binet scale. The only statement that can be made with reasonable certainty from these data is that a relationship between social work services and changes on the Binet scale has not been demonstrated.

The Impact on Reading Readiness

This hypothesis was accepted in regard to the children's performance on the Metropolitan Readiness Test. At the end of the experiment the children who received intensive social work services obtained a mean Metropolitan score of 23.2 as compared to 20.6 for the children in the regular service groups: a significant difference of 2.6 points in favor of the intensive services. It was therefore concluded that intensive social work services, as predicted, helped the children in Project Breakthrough to maximize the learning opportunities provided them in relation to reading readiness skills.

The Impact on Reading Elements

This hypothesis was not accepted in regard to the children's performance on the Reading Elements Achievement Test (REAT). Again, as a statistical caution, the null hypothesis of "no difference" between social work services and REAT performance ratings was not accepted as a consequence of the failure to accept the prediction hypothesis. The better statement is that the data were not strong enough to demonstrate the presence of a relationship between social work service differences and obtained ratings on the Reading Elements Achievement Test.

The Impact on Social Maturity and Family Functioning Capacity

This hypothesis was accepted in regard to changes in the families' ratings on the Family Functioning Instrument (FFI). Over the course of the experiment the families who received intensive social work services obtained a gain of 0.5 points (on a seven-point scale) on the FFI as compared to 0.1 points for the families who received the regular social work services. The difference of 0.4 points in favor of the intensive services was highly significant. Thus, it was tentatively concluded that the provision of intensive social work services in Project Breakthrough was effective in promoting a higher degree of family functioning as measured by the Family Functioning Instrument. This is stated as a tentative conclusion as there are potential sources of rating bias (discussed in the body of this report) which prevent the statement of a definitive conclusion.

As with the REAT scale, the Family Functioning Instrument is an experimental device which was developed by the Research and Statistics staff of the Department in an effort to obtain a more sensitive measure of the levels of family functioning capacity. The instrument requires further testing and development before it is asserted to be a measure of general use to the social work profession. However, for the Project Breakthrough sample the internal consistency of the instrument was found to be extremely high (r_{tt} = .96 for each of the four study groups), and the instrument was regarded as a useful experimental device for this study.

The prediction hypothesis was not accepted in regard to the children's ratings on the Vineland Social Maturity Scale. Some evidence was obtained to suggest a relationship between social work services, FFI scores, and changes in the ratings on the Vineland Social Maturity Scale. However, these were so tenuous that they were discussed only in the technical appendix. Those data, it was felt, were useful only as suggestive guides for further study. The best statement, considering the limiting experimental space of this research, is that the data were not strong enough to demonstrate a relationship between differences in social work services and changes in ratings on the Vineland Social Maturity Scale.

Study Limitations Regarding the Effect of Intensive Services

Most of the limitations cited for the effect of ERE training also hold for the effect of intensive social work services. However, there are a number of additional limitations of considerable importance. The data obtained from this study can in no way be used to make generalizations about qualitative social work service differences. That is, it cannot be said that the intensive workers were "better than" those who provided the regular services, nor can any of the observed differences be attributed to differences in professional training or expertise. There were no data obtained in this study to show whether professional training in social work would or would not serve as a distinct advantage.

Early plans for Project Breakthrough included the recruitment of workers with master's degrees from accredited schools of social work, and these workers were to form the intensive social work team. Recruitment difficulties in the face of getting the project under way prevented this, and the project director had to turn to the Department's casework staff as a manpower source. Actually, the recruitment difficulties which were associated with this experimental project have probably dramatized a general social work manpower shortage, and it is probably fortunate that professionally trained workers were not obtained for this study. That is, if similar programs are to be developed on an ongoing basis with sufficient scope to make a serious impact upon pre-school intellectual deficits, it is doubtful that professional social workers will be available in sufficient numbers to adequately staff such programs. Thus, by default Project Breakthrough has demonstrated that the untrained social worker can be of significant value to an educational program of this nature. Had professionally trained workers been employed, as planned, the results may have more closely approximated a "laboratory experiment" which would be difficult to replicate under "field conditions".

The Interaction of Training and Treatment

> The children receiving intensive social work services and ERE training would obtain higher performance ratings than those children receiving only regular social work services and no training.

This hypothesis concerns the interaction potential between the two independent variables, training and treatment. None of the data obtained in this study showed a significant interaction, and the hypothesis was not accepted for any of the criterion measures. Again, the experimental space is a limiting factor in drawing a conclusion of "no interaction", but in this case the data do suggest a clear independence between the experimental variables. That is, ERE training will serve to raise reading and language skills regardless of the type of social work services given. However, it appears that social work services will also help to raise these skills.

The suggestion of a "clear independence" between the training and treatment variables cannot be definitively asserted from the data obtained in this study. In several instances the observed differences followed the direction of the prediction hypothesis, and these findings may indicate a weak confirmation. However, none of the data were strong enough to warrant the acceptance of the prediction hypothesis. Further study in similar projects may shed additional light in this area. Certainly, the sophistication of the control groups by way of participation in other pre-school programs, and the extent to which large differences were really present between the intensive and regular social work service groups, would have a bearing on the possible interaction of the two experimental variables.

The above remarks should not be taken to imply that the effect of ERE training is at all dependent upon the presence of social work services. Rather, it was felt from the beginning of the project that social work services would function to enhance the effects of training: an interaction result. Had this occurred, it would have been asserted that the provision of a social work service component in a program such as Project Breakthrough was a necessary contingent to the maximization of program results. Since the expected interaction was not observed, a statement of recommendation for the use of social work services cannot be quite so strong.

The Effect of Family Functioning Differences

> The children who came from families with higher levels of family functioning capacity would achieve higher performance ratings at the end of the project than a group of similar children who came from families with lower levels of family functioning.

As such, this hypothesis was not testable in this study in relation to any of the criterion measures used. The results of the Family Functioning Instrument pre-test ratings were used as a control variable rather than an experimental variable, and on this basis it was not possible to demonstrate the effect of the family functioning ratings in relation to the Binet, Peabody or Metropolitan scores. Some evidence was obtained, as mentioned earlier, to suggest a possible relationship with the Vineland scores, but this was extremely tenuous. Family Functioning Instrument ratings did appear to be highly related, as a control variable, to the results obtained on the Reading Elements Achievement Test. In those instances where the FFI ratings appeared to have some effect, the purpose of the analysis consisted only in removing such effects from the main body of the statistical evaluation.

The Research Questions

In addition to the four major hypotheses, a number of research questions were also specified in Chapter I. All but two of these were dealt with in the discussions of the major hypotheses, and the remaining questions are reviewed as follows.

> Is there any evidence in this study to support the notion that a poverty environment or culture affects the reading, verbal and language development of the children?

A definitive answer to this question is not provided with the data obtained from this study. However, the extent of IQ retrogression over a brief period of time does suggest the presence of environmental and cultural effects upon the children's reading and language development skills. This statement is based on the observation that the children in the study are characterized by their poverty and that the literacy levels of the tested adults in the families were quite low. This suggests, in the absence of experimental control, that the parent and child alike are faced with a severe problem of educational deficits, a problem which begins at a very early age and continues into adulthood.

Admittedly, there are hazards in making such statements on the basis of IQ scores alone. However, the adults were given a reading test rather than an IQ test, and the results should therefore reflect the end product of early educational deprivation (surely stemming in part from cultural and environmental influences), rather than a possible result of using inappropriate test instruments. What is worse, however, is the extent to which the IQ ratings of the control group children had apparently stabilized over the project period.

> Were intensive social work services effective in reducing the number of project withdrawals and the rate of absence?

This question was not dealt with in the body of the report as the research study was not focused upon management problems of the project. However, since data were obtained, an effort was made to evaluate the effect of social work services upon withdrawals from the program and absence rates.

Data regarding rates of absence, shown in Table IV-35, were obtained for the two groups of children who received training. The intensive group children, on the average, failed to attend about 33 percent of the total number of sessions available as compared to about 35 percent for the regular group children, but the difference was not significant.

It seems, in one sense, ironic that intensive social work services were associated with significant gains on objective reading and language development tests, but had apparently little or no effect upon attendance rates. That is, as an ancillary service to a training program, intensive services may be planned in some programs to function as a deterrent to low attendance when such services may in fact be more effective in regard to other criteria of even greater importance.

Of note also is the observation, in this and other studies, that social work services often have little or no observable effect upon such behavioral criteria as attendance rates, criminal recidivism, acting out behavior, delinquent acts, etc. In short, there is a considerable need to learn whether, in such studies, social work treatment plans are clearly focused on sharply delimited problems or whether in many instances the treatment actually focuses on broad areas of dysfunction in spite of statements to the contrary.

Similar findings were obtained with respect to the number of withdrawals from the project. Within the two groups receiving ERE training there were 17 withdrawals in the regular service group and 10 withdrawals in the intensive group. The difference of seven withdrawals favors the intensive services as a deterrent against drop-outs, but the difference was not significant.[1] Thus, the null hypothesis of "no difference" between the intensive and regular social work service groups with respect to the number of program withdrawals cannot be rejected.

---

[1] Chi-Square = 1.85, df = 1, P >.05

Implications

Project Breakthrough has demonstrated that very young children from poor families can be helped with reading and language development before they enter a formal school experience. In a remarkably short period of exposure, the Talking Typewriter training prepared a group of pre-kindergarten youngsters for first-grade work. In view of this, the implications of responsive environment training in poverty areas merit considerable attention.

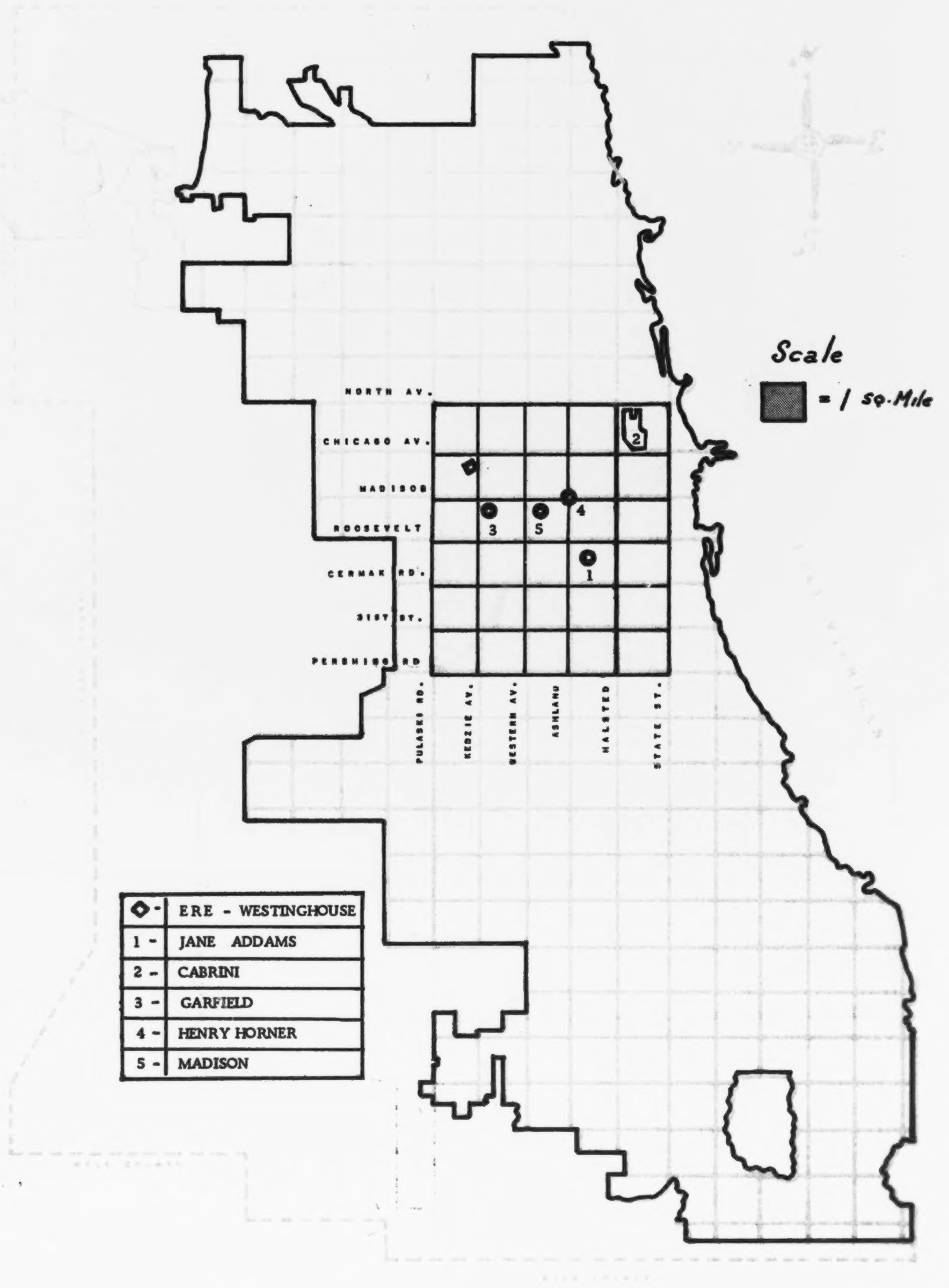
The cyclical nature of poverty is no longer questioned in a nation where success or failure is intimately linked to education and occupation. The data obtained from this study have dramatically shown that a great deal must and can be done to help poor children prepare for a meaningful educational experience. Such preparation will clearly mark one major break in the poverty cycle. With a mere 13 hours of responsive environment instruction a group of Chicago's poorest children were prepared to function at a level comparable to that of their more advantaged contemporaries. Project Breakthrough has thereby demonstrated both the need for special help and the capacity to provide it.

This research and demonstration project has now been completed. However, unlike many such projects which are forever terminated at that stage, Project Breakthrough has been transferred as an ongoing program to the Chicago Board of Education. That is but one means of utilizing the facilities of the Talking Typewriter with a responsive environment system. Public assistance agencies in many jurisdictions may wish to develop similar programs, not only for pre-school children but also for remedial reading programs developed for the adult recipient. ERE training may also be used for a potentially wide variety of federal programs of literacy training with pre-schoolers, drop-outs, and adults. In whatever capacity these training methods are applied, continued research evaluation should certainly be encouraged. However, Project Breakthrough has stood the test of rigorous evaluation, and there can be little doubt regarding the outcome of other such programs of training.

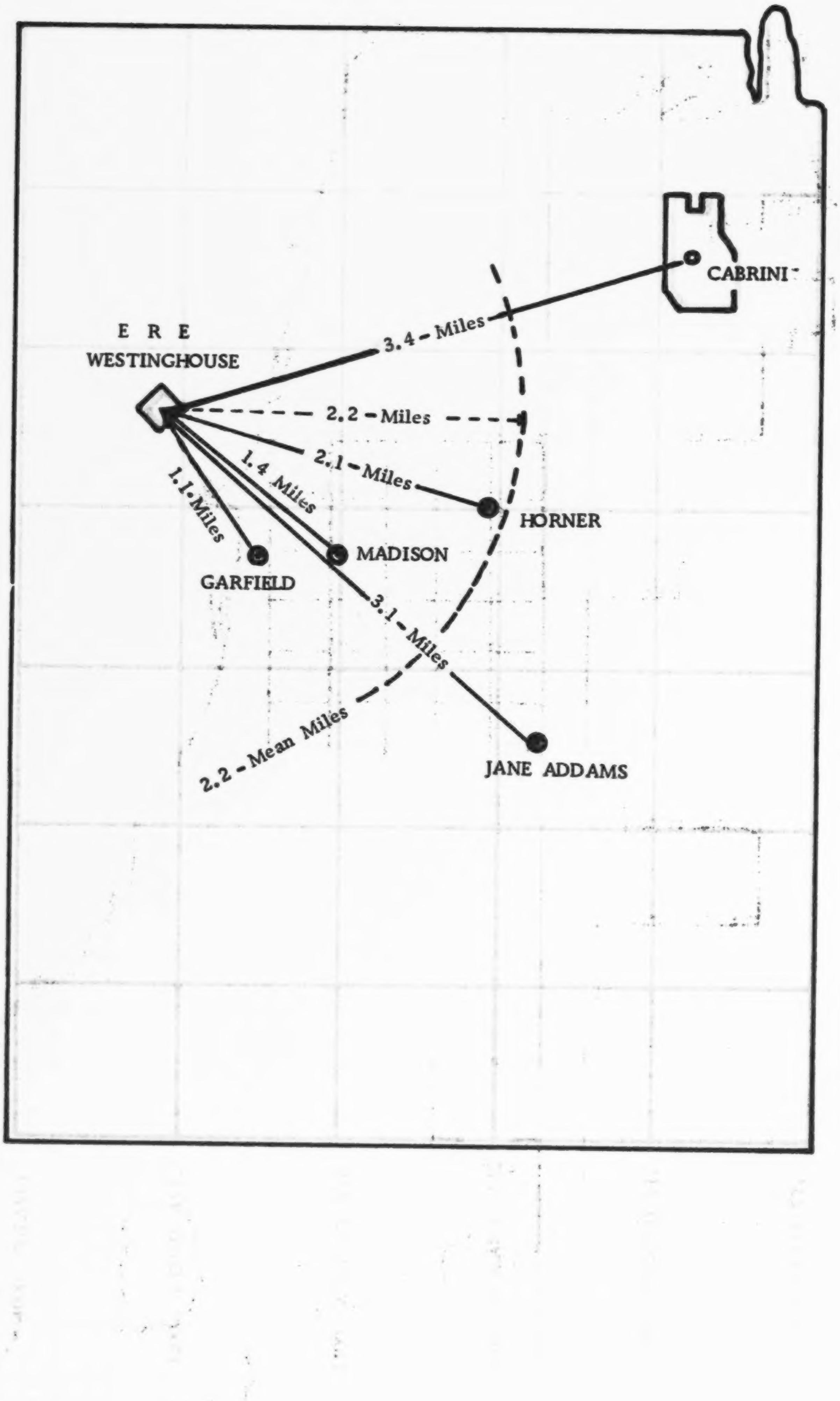
APPENDIX I

Maps and Illustration

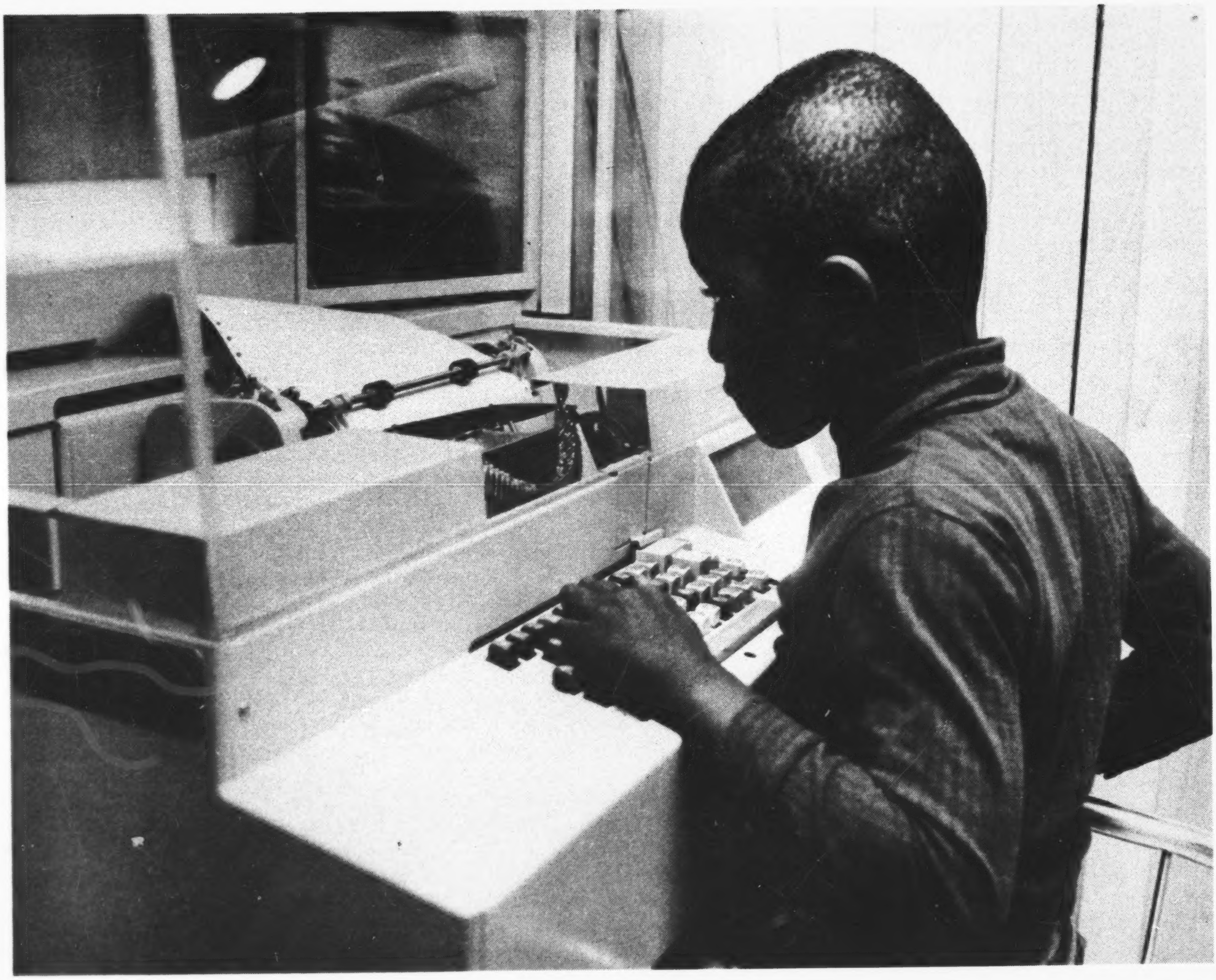
Appendix I
Exhibit 1


Scale
= 1 sq. Mile
NORTH AV.
CHICAGO AV.
MADISON
ROOSEVELT
CERMAK RD.
31ST ST.
PERSHING RD.
PULASKI RD.
KEDZIE AV.
WESTERN AV.
ASHLAND
HALSTED
STATE ST.
1
2
3
4
5
◇ - ERE - WESTINGHOUSE
1 - JANE ADDAMS
2 - CABRINI
3 - GARFIELD
4 - HENRY HORNER
5 - MADISON

Appendix I
Exhibit 2


E R E
WESTINGHOUSE
CABRINI
3.4 - Miles
2.2 - Miles
2.1 - Miles
1.4 Miles
1.1 - Miles
HORNER
MADISON
GARFIELD
3.1 - Miles
2.2 - Mean Miles
JANE ADDAMS

Appendix I
Exhibit 3



APPENDIX II

Letters to the Parents of Prospective Participants

Appendix II
Exhibit 1

COOK COUNTY DEPARTMENT OF PUBLIC AID

JOHN W. BALLEW
Acting Director

PUBLIC ASSISTANCE DIVISION

318 West Adams Street - Room 1100
Chicago, Illinois 60606
Telephone: ANdover 3-4004

Dear

You have been selected to receive this letter because you have a four-year-old child. Your caseworker has told us that you have high hopes for your child, and that you want him to have a good life and future, and that you will help him in any way you can. In a year from now you are going to be busy getting your child ready to go to school.

We ask that you start now to prepare your child for school, so he will not only learn well, but learn better. We want you to give your child the chance to learn to read by playing with an electronic "talking typewriter." With these wonderful machines, young children--even four-year-olds--learn faster, and they learn more. Many of your neighbors and friends will be sending their children to learn to read on these machines.

This teaching program is located at the new Westinghouse School, 3301 West Franklin Boulevard. Arrangements can be made to bring your child to and from the school. Unfortunately, we now have only a few machines, and not all children will be able to use them. It is important that you act now. If classes are full when you call, your child may be able to join at a later date.

We know you will want more information about the program. Please call ______________________ at ____________ on ____________, ________. She will answer your questions and register candidates for the program.

Very truly yours,

A. Louis Scott, Director
Project Breakthrough

Appendix II
Exhibit 2

Project Breakthrough

Garfield District Office

1 North Kedzie Avenue

Chicago, Illinois

August 29, 1966

Dear Parent:

Project Breakthrough is beginning in Garfield District Office on Madison and Kedzie Avenue, on Tuesday, September 6, 1966.

Your four-year old child may have a chance to learn to read by playing with an electronic teaching machine - a talking typewriter. With this system children learn faster, and they learn more.

You may come into Garfield District Office any time on Tuesday or Wednesday and see the machines, and learn about the project.

If you would like to enter your child in the first group, he will have to be tested on Thursday, September 1, 1966, in Garfield District Office.

For an appointment, call Mr. Edelhart at 533-3440. If you do not have an appointment you may bring your child to Garfield District Office on Thursday, but we cannot promise that he will be seen.

There are also some jobs for older teenage girls, who should call Mr. Edelhart if they would be interested in working for Project Breakthrough.

Yours truly,

A. Louis Scott, Director
Project Breakthrough

ALS:ef

APPENDIX III

Study Instruments

Appendix III
Exhibit 1

PROJECT BREAKTHROUGH

Social Profile of Family

GRANTEE NAME: ______________________

Case Number ______________

Name of Caseworker ______________________

Category ___________

District Office ___________

Case Load ___________

Subject Child: Pre-School Experience ____

2	3	4	*	5		6	7	8	9	10	11	12	13	
SURNAME	FIRST NAME	MEMBER'S STATUS IN FAMILY	MEMBER'S I.D. IN THE FAMILY	DATE OF BIRTH		SUBJECT OR NON-SUBJECT	RACE	SEX	MARITAL STATUS	RELIGIOUS AFFILIATION	HIGHEST GRADE COMPLETED	WORK EXPERIENCE	LONGEST TIME ON ONE JOB	TOTAL TIME ON ASSISTANCE
				MONTH	YEAR									

Appendix III
Exhibit 2

PROJECT BREAKTHROUGH

Coding Instructions

Please read these instructions before completing attached "SOCIAL PROFILE"

General rules: a. If information is not known, complete the digit space or spaces by placing (0) or zeroes in each space or spaces.

b. In column where month and year or months and years have to be stated use zero (0) on first of two months or year digit to indicate the 1st month and year to the 9th month and year. For example, 01 = January, 02 = February, 10 = October.

If a subject is not a welfare recipient write "non-recipient" instead of "case number".

1. Pre-school Experience:

1 = Headstart
2 = Other Public Programs
3 = Private Programs
4 = None
5 = August '66 ERE Enrollment

2. - 3. List the name of each family member (including all persons who live together as a unit) in the following order: (a) Parents, including Step-Parents (b) Siblings in order of birth, oldest to youngest; treat half-siblings as siblings (c) Grandparents (d) Uncles (e) Aunts (f) Cousins (g) Other relatives or non-relatives living in the family unit.

4. Show the relationship of each person to the child (or person) who is participating in Project Breakthrough, i.e., father, mother, brother, sister, etc. For participant, write: "Subject".

5. Show the month and year of birth of each person as follows: January 1961 should be entered as 01-61.

6.
1 = Subject Student
2 = Non-subject in the program
3 = Participant (a non-subject in the program, but has tried the ERE machine more than once)

7.
1 = White
2 = Negro
3 = Puerto Rican
4 = Oriental
5 = Other

8.
1 = Male
2 = Female

9. 1 = Single
2 = Married, living with spouse
3 = Desertion
4 = Legal separation
5 = Voluntary separation
6 = Involuntary separation
7 = Divorced
8 = Widowed
9 = Common Law

10. 1 = Catholic
2 = Protestant
3 = Jewish
4 = Other
5 = None
6 = Unknown

11. 00 = None
01 = 1st Grade, etc.
12 = 12th Grade
13 = 1st year of college
14 = 2 or more years of college
15 = Ungraded
16 = Unknown

12. (Specify the type of work the person has done most frequently or which he considers his major occupation.)
1 = Professional and Semi-professional
2 = Clerical and Sales
3 = Domestic Services
4 = Agricultural Occupations
5 = Skilled Labor
6 = Semi-skilled Labor
7 = Unskilled Labor
8 = Unknown
9 = None

13. 00 = None
01 = Less than 6 months
02 = 6 months - Less than 1 year
03 = 1 year - Less than 2 years
04 = 2 years - Less than 3 years
05 = 3 years - Less than 5 years
06 = 5 years - Less than 10 years
07 = 10 years - Less than 15 years
08 = 15 years and over
09 = Unknown

14. Use same codes as "Longest Time on One Job."

COMMENTS

* Indicate members I.D. in the family according to coding instructions below. Treat step-father or step-mother as mother or father. Treat half-siblings as siblings etc. (Please Note: In the sibling category the first digit of the three digit number specifies the sex of the child, for example, 1 = male, 2 = female. The second and third digit of the three digit number specifies the order of birth. For example, 2 0 4 indicates a female child and the fourth child born in the family; 1 0 9 indicates a male child and the ninth child born in the family.)

System of Codes: (to be inserted in the column, "Member's I.D. in the Family")

Father = 3 0 0

Mother = 4 0 0

Siblings

Male	Female
1 0 1	2 0 1
1 0 2	2 0 2
1 0 3	2 0 3
1 0 4	2 0 4
1 0 5	2 0 5
1 0 6	2 0 6
1 0 7	2 0 7
1 0 8	2 0 8
1 0 9	2 0 9
1 1 0	2 1 0

etc.

Paternal
Grandfather = 3 1 0
Paternal
Grandmother = 3 2 0

Maternal
Grandfather = 4 1 0
Maternal
Grandmother = 4 2 0

Uncles = 5 0 0 to 5 0 9
Aunts = 6 0 0 to 6 0 9

Cousins:
Male = 7 0 0 to 7 0 9
Female = 8 0 0 to 8 0 9

Other
Male = 7 1 0 to 7 9 9
Female = 8 1 0 to 8 9 9

Appendix III
Exhibit 3

COOK COUNTY DEPARTMENT OF PUBLIC AID
Research and Statistics

PROJECT BREAKTHROUGH - SCREENING REPORT OF TEST RESULTS

(To be completed by the SCREENING Department)

This section to be completed by the Caseworker

Adult's Name

Subject's (student's) Name ____________________

Birth Date of Subject ________ ________ ________
Date Month Year

Adult's Relationship to Subject (student) ____________

Name of Caseworker ____________________

Case Number __ __ __ __ __ (1-6)

District Office __ __ __ (8-10)

Case Load __ __ __ (11-13)

ADULT'S
READING SCORE

__ __ __

(56 - 58)

SUBJECT'S (STUDENT'S) SCORES

Stanford Binet	Metropolitan Reading Readiness Scale	Vineland Social Maturity Scale
__ __ __	__ __ __	__ __ __
(40 - 42)	(43 - 45)	(50 - 52)

COMMENTS:

Date ________/______/______
Month Date Year

Appendix III
Exhibit 4

COOK COUNTY DEPARTMENT OF PUBLIC AID
Research and Statistics

PROJECT BREAKTHROUGH

Report of ERE Activity

NAME: ____________________, ____________________ (____________________)
Surname — Parent's First Name — Child's First Name

DATE OF CHILD'S FIRST DAY ON ERE MACHINE:

____________ ____________ ____
Month — Day — Year

	Total Days on ERE	Total Minutes on ERE	Total Absences*
Total			
________ ____ Month Year			
________ ____ Month Year			
________ ____ Month Year			
________ ____ Month Year			

* Specify reasons for absences on reverse side of paper.

Appendix III
Exhibit 5

COOK COUNTY DEPARTMENT OF PUBLIC AID
Research and Statistics

PROJECT BREAKTHROUGH

Report of Intensive Casework Activity

NAME: ____________________, ____________________ (____________________)
Surname — Parent's First Name — Child's First Name

DATE OF INITIAL CONTACT WITH CLIENT FOR INTENSIVE SOCIAL WORK SERVICES:

__________ __________ __________
Month Day Year

I S W CONTACTS				
	Home Visits	Office Visits	Collateral Visits	Telephone
TOTAL				
______ ____ Month Year				
______ ____ Month Year				
______ ____ Month Year				
______ ____ Month Year				

Appendix III
Exhibit 6

COOK COUNTY DEPARTMENT OF PUBLIC AID
Research and Statistics

PROJECT BREAKTHROUGH

Report of Regular Casework Activity

NAME: ____________________, ____________________ (____________________)
Surname, Parent's First Name, Child's First Name

DATE OF INITIAL CONTACT WITH CLIENT FOR REGULAR SOCIAL WORK SERVICES:

____________ ____________ ____________
Month Day Year

DATE OF LAST CONTACT WITH CLIENT FOR REGULAR SOCIAL WORK SERVICES:

____________ ____________ ____________
Month Day Year

R S W CONTACTS				
	Home Visits	Office Visits	Collateral Visits	Telephone
TOTAL				
______ Month ______ Year				
______ Month ______ Year				
______ Month ______ Year				
______ Month ______ Year				

Appendix III
Exhibit 7

COOK COUNTY DEPARTMENT OF PUBLIC AID
Project Breakthrough

FAMILY FUNCTIONING INSTRUMENT

RESEARCH AND STATISTICS

FEBRUARY 1967

FAMILY IDENTIFICATION IN THE AGENCY

Grantee Name: ______________________________
Last First Middle

Case Number: ____________________

Category: __________

District Office: __________________

Case Load:__________

STUDENT'S (OR SUBJECT'S) IDENTIFICATION

Name: ______________________________
Last First Middle

I. D. in the Project: __________

IDENTIFICATION OF RESPONDENT

Name: ______________________________
Last First Middle

Relationship to the student (or subject child):__________________

Name of Caseworker:__________________

Length of experience as a caseworker

_______/_______
months years

Completion of Instrument (Date)

______/___/_____
Month Day Year

INSTRUCTIONS

The Project Breakthrough Family Functioning Instrument has been constructed to measure performance which describes some of the major elements of the overall social and familial functioning of a family unit. As a measurement of performance no provision has been made for the recording of family attitudes or feelings. Therefore, the user of this instrument must not allow his knowledge of these to influence his rating of the performance areas included.

The instrument has been divided into two parts. Part I provides a list of performance areas which must be rated by the user. The rating scale ranges from 0 to 7 with an X rating to indicate that the specific item is not relevant to the family under study. The user completes the instrument by drawing a circle around the rating which best describes the performance of the family. The values to be used in the ratings are as follows:

X	Does Not Apply
0	Qualified Judgment Cannot Be Given
1	Inferior
2	Poor
3	Low
4	Average
5	Good
6	Excellent
7	Superior

The user must not hesitate to render either very high or very low ratings when he feels they are warranted.

When the user must indicate that he cannot render a qualified judgment for an item, this indicates that he either cannot obtain the appropriate and relevant information with which to render a judgment, or that he as a judge is not qualified to evaluate the information that is available.

For items relating to children in families where there are more than two children, the user is to rate the performance of the majority of the children. When there are only two children in the family the performance is rated for the child who participates as a student in Project Breakthrough.

In Part II of the instrument the user indicates whether the events described have occurred with the family by checking "Yes" or "No" on each item.

The means with which the user will obtain the data to provide performance ratings are dependent solely upon the user's own casework skills. However, the user MUST NOT take this instrument into the home or expose it to the family at any time.

In providing judgments of performance for the families, the user is required to render ratings which are consistent with the norms for families receiving public assistance. That is, care should be taken to avoid rending judgments on the basis of norms and standards which are clearly inappropriate for the public assistance population.

PART I

Circle One Only:

1. Cleanliness of rooms and furnishings . . . . X 0 1 2 3 4 5 6 7
2. Orderliness of rooms and furnishings . . . . X 0 1 2 3 4 5 6 7
3. Personal hygiene of the family members . . . . . . X 0 1 2 3 4 5 6 7
4. Appearance of preschool children's apparel . . . . X 0 1 2 3 4 5 6 7
5. Appearance of apparel of school age children . . . X 0 1 2 3 4 5 6 7
6. Appearance of adult's apparel . . . . X 0 1 2 3 4 5 6 7
7. General Health of the family . . . . X 0 1 2 3 4 5 6 7
8. Food shopping habits (shopping for bargains or on budget) . . . . X 0 1 2 3 4 5 6 7
9. Use of income to cover needs of food . . . . X 0 1 2 3 4 5 6 7
10. Use of income to cover clothing . . . . X 0 1 2 3 4 5 6 7
11. Use of income to cover household essentials . . . X 0 1 2 3 4 5 6 7
12. Avoidance of excessive indebtedness . . . . X 0 1 2 3 4 5 6 7
13. Absence or control of impulse purchases of non-utility items (such as unneeded clothing, jewelry, sweets, colas, etc.) . . . . X 0 1 2 3 4 5 6 7
14. Planning of balanced meals . . . . X 0 1 2 3 4 5 6 7
15. Supervision of children . . . . X 0 1 2 3 4 5 6 7
16. Adults read to or with the children . . . . X 0 1 2 3 4 5 6 7
17. Adults spend time playing with children . . . . . X 0 1 2 3 4 5 6 7
18. Adults have time for leisure . . . . X 0 1 2 3 4 5 6 7
19. Adults' participation in community activities . . X 0 1 2 3 4 5 6 7
20. Exposure of the children to education institutions (such as museums, libraries, etc.) . . . X 0 1 2 3 4 5 6 7
21. Exposure of the children to recreational institutions (such as parks, movies, etc.) . . . . . X 0 1 2 3 4 5 6 7
22. Exposure of the children to large shopping centers . . . . X 0 1 2 3 4 5 6 7

	Circle One Only:
23. Ability to grant reasonable freedom of activity to the children	X 0 1 2 3 4 5 6 7
24. Demand on the children for achievement in school	X 0 1 2 3 4 5 6 7
25. Control of absenteeism from school for children over 6 years old	X 0 1 2 3 4 5 6 7
26. Adults' interest in furthering the children's education	X 0 1 2 3 4 5 6 7
27. Rewarding achievement of the children with affection	X 0 1 2 3 4 5 6 7
28. Rewarding achievement tangeably by giving material rewards	X 0 1 2 3 4 5 6 7
29. Rewarding children's initiative for trying something new	X 0 1 2 3 4 5 6 7
30. Explaining rewards to the children	X 0 1 2 3 4 5 6 7
31. Explaining punishment to the children	X 0 1 2 3 4 5 6 7
32. Adults' participation in PTA activities	X 0 1 2 3 4 5 6 7
33. Interest in problems the children may have in school	X 0 1 2 3 4 5 6 7
34. Adults' search for contact with school personnel when needed	X 0 1 2 3 4 5 6 7
35. Adults' knowledge of the children's progress in school	X 0 1 2 3 4 5 6 7
36. Adults' knowledge of the children's behavior in school	X 0 1 2 3 4 5 6 7
37. Setting limits of behavior for the children	X 0 1 2 3 4 5 6 7
38. Giving a sense of responsibility to the children	X 0 1 2 3 4 5 6 7
39. Availability of adults' reading material in the home	X 0 1 2 3 4 5 6 7
40. Adults' use of the public library	X 0 1 2 3 4 5 6 7
41. Availability of children's reading material in the home	X 0 1 2 3 4 5 6 7
42. Adults' discussion of school events with the children	X 0 1 2 3 4 5 6 7

PART I Circle One Only:

43. Guidance of children regarding school problems . . . . X 0 1 2 3 4 5 6 7

44. Giving help to school age children with homework . . . . X 0 1 2 3 4 5 6 7

45. Adults' willingness to answer children's questions . . . . X 0 1 2 3 4 5 6 7

46. Adults' level of language skill . . . . X 0 1 2 3 4 5 6 7

47. Giving clear messages to children . . . . X 0 1 2 3 4 5 6 7

48. Children are free to express their needs and wishes . . . . X 0 1 2 3 4 5 6 7

49. Adults' use of correct grammar . . . . X 0 1 2 3 4 5 6 7

50. Extent to which the family plans meals together as a unit . . . . X 0 1 2 3 4 5 6 7

PART II Check One Only:

51. The rent is paid regularly . . . . 0 ___ Yes ___ No ___

52. Boys and girls over 5 years of age sleep in separate rooms . . . . 0 ___ Yes ___ No ___

53. Adequate study space is available for the children . . . . 0 ___ Yes ___ No ___

54. Adequate space is available for storage of children's toys . . . . 0 ___ Yes ___ No ___

55. Children have creative toys . . . . 0 ___ Yes ___ No ___

56. Children have breakfast regularly . . . . 0 ___ Yes ___ No ___

57. Children promptly return home from school . . . 0 ___ Yes ___ No ___

58. Children have hobbies . . . . 0 ___ Yes ___ No ___

59. Adults have hobbies . . . . 0 ___ Yes ___ No ___

60. Do any of the adults have a library card? . . . 0 ___ Yes ___ No ___

PART II Check One Only:

---

61. Do any of the children have a library card? . . . 0 ___ Yes ___ No ___

62. Does the family have a television . . . . 0 ___ Yes ___ No ___

63. Does the family have a radio . . . . 0 ___ Yes ___ No ___

64. Does the family have a record player . . . . . . 0 ___ Yes ___ No ___

65. Have the adults ever been to a Museum? . . . . . 0 ___ Yes ___ No ___

66. Have the children ever been to a Museum? . . . . 0 ___ Yes ___ No ___

67. Have the adults ever been to a Planetarium? . . . 0 ___ Yes ___ No ___

68. Have the children ever been to a Planetarium? . . 0 ___ Yes ___ No ___

69. Have the adults ever been to an Aquarium? . . . . 0 ___ Yes ___ No ___

70. Have the children ever been to an Aquarium? . . . 0 ___ Yes ___ No ___

71. Have the adults ever been to the Loop? . . . . . 0 ___ Yes ___ No ___

72. Have the children ever been to the Loop? . . . . 0 ___ Yes ___ No ___

73. Have the adults ever ridden the "L"? . . . . . . 0 ___ Yes ___ No ___

74. Have the children ever ridden the "L"? . . . . . 0 ___ Yes ___ No ___

75. Have the adults ever seen Lake Michigan? . . . . 0 ___ Yes ___ No ___

76. Have the children ever seen Lake Michigan? . . . 0 ___ Yes ___ No ___

77. Have the adults ever been to a large department store (such as Marshall Fields)? . . . . 0 ___ Yes ___ No ___

78. Have the children ever been to a large department store (such as Marshall Fields)? . . . . 0 ___ Yes ___ No ___

79. Have the adults ever been to the Zoo? . . . . 0 ___ Yes ___ No ___

80. Have the children ever been to the Zoo? . . . . . 0 ___ Yes ___ No ___

81. Have the adults ever been to an airport (such as the O'Hare and Midway Terminals)? . . 0 ___ Yes ___ No ___

82. Have the children ever been to an airport (such as the O'Hare and Midway Terminals)? . . 0 ___ Yes ___ No ___

Appendix III
Exhibit 8

DEFINITION OF PERFORMANCE LEVELS

Recognizes Shapes: The child transfers the symbol (stimulus) on sight to the ERE keyboard when he recognizes that the key he has depressed looks like the symbol (visual cue) presented to him by the booth attendant. Achievement demonstrates that the child is beginning to perceive the shape of a given symbol and that he is comparing the shape on one symbol with the shape of another.

Recognizes Sounds: The child transfers the symbol (auditory cue) to the ERE keyboard upon hearing the sound representing the symbol (letter name) as pronounced by the booth attendant and re-pronounced by the ERE Talking Typewriter. Achievement demonstrates that the child is aware that the symbol (printed) has a name (auditory) and that he exhibits a non-reinforced association of the two (visual:auditory).

Knows Shapes and Sounds: The child can visually and verbally identify a given letter: (a) he can demonstrate knowledge of the symbol "name" by responding to a visual cue by depressing the appropriate key without an accompanying auditory cue; and/or (b) he can demonstrate knowledge of the symbol by depressing the appropriate key without an accompanying visual cue or stimulus.

Knows Upper-Case Letters: The child can exhibit reinforced correct response to a visual and/or auditory cue to upper-case letters. That is, he can identify the letter when seen in isolation, i.e., on a flashcard, or he can identify it in context, i.e., in a word. His response can be verbal (naming the letter), graphic (reproducing the letter), or physical (pointing it out).

Knows Lower-Case Letters: The child can exhibit reinforced correct response to a visual and/or auditory cue to lower-case letters. (See above definition.)

Knows Phonetic Elements: The child exhibits an ability to correctly recognize and discriminate upon audition the separate phonemes of the English language and can type or print or locate a letter (case not considered) as a visual response to an auditory cue when that cue is one of the phonetic elements of the given letter. The child need not pronounce the phonetic element.

Recognizes Sight Words: The child recognizes words upon visual contact and can say the word without maximal stimulation. The decision that the child performs in this area should be based upon recognition that the knowledge of the sight word has been habituated (reinforced) and that the response is not a result of guess.

APPENDIX IV

Tables

TABLE IV-1

SIZE OF FAMILY

Comparison of Means

			Casework Treatment			
Training	Total		Intensive		Regular	
Exposure	Mean	N	Mean	N	Mean	N
Total	6.4	136	6.5	68	6.2	68
ERE	6.5	68	6.9	34	6.1	34
Control	6.2	68	6.1	34	6.4	34

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation
Social Work	1	1.65	0.28	> .05	Not Significant
Training	1	1.65	0.28	> .05	Not Significant
Interaction	1	11.18	1.92	> .05	Not Significant
Residual	132	5.84			
Total	135				

TABLE IV-2

AGE OF TESTED ADULTS

Comparison of Means

Training Exposure	Total Mean	Total N	Casework Treatment Intensive Mean	Intensive N	Regular Mean	Regular N
Total	33.0	136	32.8	68	33.1	68
ERE	33.3	68	33.8	34	32.8	34
Control	32.6	68	31.7	34	33.5	34

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation
Social Work	1	57,605.89	0.11	>.05	Not Significant
Training	1	180,238.24	0.35	>.05	Not Significant
Interaction	1	624,384.01	1.21	>.05	Not Significant
Residual	132	516,476.32			
Total	135				

TABLE IV-3

YEARS OF SCHOOLING COMPLETED BY THE FATHER

Comparison of Means

Training Exposure	Total Mean	Total N	Casework Treatment Intensive Mean	Intensive N	Regular Mean	Regular N
Total	9.0	24	7.9	13	10.4	11
ERE	9.5	14	8.0	7	11.0	7
Control	8.4	10	7.8	6	9.3	4

Analysis of Variance For Training Variable

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation
Training	1	7.06	0.88	> .05	Not Significant
Residual	22	8.00			
Total	23				

Analysis of Variance For Social Work Variable

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation
Social Work	1	35.49	5.30	<.05	Significant
Residual	22	6.70			
Total	23				

TABLE IV-4

YEARS OF SCHOOLING COMPLETED BY THE MOTHER

Comparison of Means

			Casework Treatment			
Training	Total		Intensive		Regular	
Exposure	Mean	N	Mean	N	Mean	N
Total	9.2	134	8.9	67	9.4	67
ERE	9.2	68	8.8	34	9.5	34
Control	9.2	66	9.1	33	9.2	33

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation
Social Work	1	5.04	0.76	>.05	Not Significant
Training	1	2.99	0.45	>.05	Not Significant
Interaction	1	2.42	0.36	>.05	Not Significant
Residual	130	6.64			
Total	133				

TABLE IV-5

YEARS OF SCHOOLING REPORTED BY THE TESTED ADULT

Comparison of Means

			Casework Treatment			
Training	Total		Intensive		Regular	
Exposure	Mean	N	Mean	N	Mean	N
Total	9.1	134	8.9	67	9.3	67
ERE	9.1	68	8.7	34	9.4	34
Control	9.2	66	9.1	33	9.2	33

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation
Social Work	1	5.85	0.91	>.05	Not Significant
Training	1	1.07	0.17	>.05	Not Significant
Interaction	1	2.99	0.46	>.05	Not Significant
Residual	130	6.46			
Total	133				

TABLE IV-6

STANFORD ACHIEVEMENT TEST SCORES FOR THE TESTED ADULT

Comparison of Means

Training Exposure	Total Mean	Total N	Casework Treatment: Intensive Mean	Intensive N	Regular Mean	Regular N
Total	5.2	136	5.2	68	5.2	68
ERE	4.9	68	4.6	34	5.2	34
Control	5.4	68	5.7	34	5.1	34

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation
Social Work	1	7.53	0.02	> .05	Not Significant
Training	1	952.94	1.95	> .05	Not Significant
Interaction	1	1,212.03	2.48	> .05	Not Significant
Residual	132	489.28			
Total	135				

TABLE IV-7

YEARS OF AGE AT START OF PROJECT

Comparison of Means

Training Exposure	Total Mean	Total N	Casework Treatment Intensive Mean	Casework Treatment Intensive N	Casework Treatment Regular Mean	Casework Treatment Regular N
Total	4.2	136	4.3	68	4.2	68
ERE	4.2	68	4.3	34	4.2	34
Control	4.2	68	4.3	34	4.2	34

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation
Social Work	1	1436.50	0.80	>.05	Not Significant
Training	1	36.03	0.02	>.05	Not Significant
Interaction	1	56.94	0.03	>.05	Not Significant
Residual	132	1806.05			
Total	135				

TABLE IV-8

YEARS OF AGE AT END OF PROJECT

Comparison of Means

Training Exposure	Total Mean	Total N	Casework Treatment Intensive Mean	Casework Treatment Intensive N	Casework Treatment Regular Mean	Casework Treatment Regular N
Total	4.9	136	5.0	68	4.8	68
ERE	4.9	68	5.0	34	4.8	34
Control	4.9	68	5.0	34	4.8	34

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation
Social Work	1	16,214.89	8.18	< .005	Significant
Training	1	104.13	0.05	> .05	Not Significant
Interaction	1	33.01	0.02	> .05	Not Significant
Residual	132	1,983.23			
Total	135				

TABLE IV-9

BIRTH RANK

Comparison of Means

Training Exposure	Total		Casework Treatment Intensive		 Regular	
	Mean	N	Mean	N	Mean	N
Total	4.3	136	4.4	68	4.2	68
ERE	4.4	68	4.8	34	4.1	34
Control	4.2	68	3.9	34	4.4	34

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation
Social Work	1	0.47	0.11	>.05	Not Significant
Training	1	1.88	0.43	>.05	Not Significant
Interaction	1	12.97	2.98	>.05	Not Significant
Residual	132	4.35			
Total	135				

TABLE IV-10

NUMBER OF CHILDREN IN FAMILY

Comparison of Means

Training Exposure	Total Mean	Total N	Casework Treatment Intensive Mean	Casework Treatment Intensive N	Casework Treatment Regular Mean	Casework Treatment Regular N
Total	5.1	136	5.3	68	5.0	68
ERE	5.2	68	5.6	34	4.8	34
Control	5.1	68	4.9	34	5.3	34

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation
Social Work	1	0.60	0.11	> .05	Not Significant
Training	1	0.36	0.07	> .05	Not Significant
Interaction	1	12.36	2.37	> .05	Not Significant
Residual	132	5.20			
Total	135				

TABLE IV-11

NUMBER OF YOUNGER SIBLINGS IN FAMILY

Comparison of Means

Training Exposure	Total		Casework Treatment			
			Intensive		Regular	
	Mean	N	Mean	N	Mean	N
Total	.8	136	.8	68	.8	68
ERE	.8	68	.8	34	.8	34
Control	.9	68	.9	34	.9	34

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation
Social Work	1	0.01	0.01	>.05	Not Significant
Training	1	0.60	0.66	>.05	Not Significant
Interaction	1	0.01	0.01	>.05	Not Significant
Residual	132	0.90			
Total	135				

TABLE IV-12

PRE-TEST METROPOLITAN READINESS SCORES: UNMATCHED GROUPS

Comparison of Means

Item	Total	Group I	Group III
Mean	15.8	14.4	17.8
Number	41	24	17

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation
Between	1	114.34	0.39	> .05	Not Significant
Within	39	296.62			
Total	40				

TABLE IV-13

PRE-TEST METROPOLITAN READINESS SCORES

Comparison of Means

Item	Total	Group I	Group III
Mean	16.1	14.8	17.4
Number	24	12	12

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation
Between	1	42.66	1.49	> .05	Not Significant
Within	22	28.60			
Total	23				

TABLE IV-14

PRE-TEST STANFORD-BINET SCORES

Comparison of Means

Training Exposure	Total Mean	Total N	Casework Treatment Intensive Mean	Casework Treatment Intensive N	Casework Treatment Regular Mean	Casework Treatment Regular N
Total	89.3	136	88.8	68	89.8	68
ERE	89.4	68	89.1	34	89.8	34
Control	89.2	68	88.6	34	89.8	34

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation*
Social Work	1	27.36	44.85	<.001	Significant
Training	1	2.12	3.48	>.05	Not Significant
Binet IQ	33	421.29	690.64	<.001	Significant
Training by Social Work	1	2.12	3.48	>.05	Not Significant
Binet IQ by Social Work	33	23.33	38.25	<.001	Significant
Binet IQ by Training	33	0.64	1.05	>.25	Not Significant
Error	33	0.61			
Total	135				

*The main effects of training and treatment and their interaction were evaluated on a two-tailed test at the .05 level, but all other sources were evaluated at the .25 level in order to reduce the risk of a Type II error. See Appendix V.

TABLE IV-15

PRE-TEST FAMILY FUNCTIONING SCORES:

RAW SCORES

Comparison of Means

Training Exposure	Total Mean	Total N	Casework Treatment Intensive Mean	Intensive N	Regular Mean	Regular N
Total	4.1	136	4.0	68	4.2	68
ERE	4.2	68	4.2	34	4.2	34
Control	4.0	68	3.9	34	4.1	34

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation*
Social Work	1	41.36	0.83	>.05	Not Significant
Training	1	78.01	1.57	>.05	Not Significant
Binet IQ	33	74.35	1.49	<.25	Significant
Training by Social Work	1	20.65	0.41	>.05	Not Significant
Binet IQ by Social Work	33	48.33	0.97	>.05	Not Significant
Binet IQ by Training	33	60.43	1.21	<.25	Significant
Error	33	49.81			
Total	135				

*The main effects of training and treatment and their interaction were evaluated on a two-tailed test at the .05 level, but all other sources were evaluated at the .25 level in order to reduce the risk of a Type II error. See Appendix V.

TABLE IV-16

PRE-TEST FAMILY FUNCTIONING SCORES:

ADJUSTED SCORES

Comparison of Means

Training Exposure	Total Mean	Total N	Casework Treatment: Intensive Mean	Intensive N	Casework Treatment: Regular Mean	Regular N
Total	4.2	136	4.1	68	4.2	68
ERE	4.2	68	4.2	34	4.2	34
Control	4.1	68	4.0	34	4.2	34

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation
Social Work	1	35.01	0.71	>.05	Not Significant
Training	1	87.36	1.78	>.05	Not Significant
Binet IQ	33	86.03	1.75	<.25	Significant
Training by Social Work	1	41.36	0.84	>.05	Not Significant
Binet IQ by Social Work	33	57.37	1.17	>.25	Not Significant
Binet IQ by Training	33	66.81	1.36	<.25	Significant
Error	33	49.12			
Total	135				

*The main effects of training and treatment and their interaction were evaluated on a two-tailed test at the .05 level but all other sources were evaluated at the .25 level in order to reduce the risk of a Type II error. See Appendix V.

TABLE IV-17

PRE-TEST VINELAND SOCIAL MATURITY SCORES

Comparison of Means

Training Exposure	Total Mean	Total N	Casework Treatment: Intensive Mean	Intensive N	Regular Mean	Regular N
Total	5.2	132	5.3	66	5.1	66
ERE	5.1	66	5.3	33	5.0	33
Control	5.3	66	5.3	33	5.3	33

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation*
Social Work	1	74.25	0.76	>.05	Not Significant
Training	1	96.73	0.99	>.05	Not Significant
Binet IQ	32	90.01	0.92	>.25	Not Significant
Social Work by Training	1	93.34	0.95	>.05	Not Significant
Binet IQ by Social Work	32	105.80	1.08	>.25	Not Significant
Binet IQ by Training	32	71.88	0.73	>.25	Not Significant
Error	32	97.86			
Total	131				

*The main effects of training and treatment and their interaction were evaluated on a two-tailed test at the .05 level, but all other sources were evaluated at the .25 level in order to reduce the risk of a Type II error. See Appendix V.

TABLE IV-18

HOURS OF TRAINING FOR THE ERE GROUPS

Comparison of Means

Item	Total	Casework Treatment Intensive	Regular
Mean	12.7	14.0	11.3
Number	68	34	34

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation*
Social Work	1	122.31	4.62	<.05	Significant
Binet IQ	33	39.05	1.47	<.25	Significant
Error	33	26.48			
Total	67				

*The main effect of social work was evaluated on a two-tailed test at the .05 level, but the other source was evaluated at the .25 level to reduce the risk of a Type II error. See Appendix V.

TABLE IV-19

NUMBER OF TRANSFER SESSIONS FOR ERE GROUPS

Comparison of Means

Item	Total	Casework Treatment Intensive	Casework Treatment Regular
Mean	6.8	8.1	5.5
Number	68	34	34

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation
Between	1	113.88	6.50	$<.05$	Significant
Within	66	17.52			
Total	67				

TABLE IV-20

NUMBER OF HOME VISITS

Comparison of Means

Training Exposure	Total Mean	Total N	Casework Treatment: Intensive Mean	Intensive N	Regular Mean	Regular N
Total	4.2	135	6.0	67	2.5	68
ERE	4.2	68	6.4	34	2.1	34
Control	4.2	67	5.5	33	3.0	34

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation
Social Work	1	406.44	65.66	<.001	Significant
Training	1	0.02	0.00*	>.05	Not Significant
Interaction	1	28.47	4.60	<.025	Significant
Residual	131	6.19			
Total	134				

*The actual value is 0.005 or less.

TABLE IV-21

NUMBER OF COLLATERAL VISITS

Comparison of Means

			Casework Treatment			
Training	Total		Intensive		Regular	
Exposure	Mean	N	Mean	N	Mean	N
Total	1.0	135	1.6	67	0.3	68
ERE	1.1	68	1.8	34	0.4	34
Control	0.8	67	1.4	33	0.3	34

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation
Social Work	1	57.33	22.93	< .001	Significant
Training	1	1.90	0.76	> .05	Not Significant
Interaction	1	0.83	0.33	> .05	Not Significant
Residual	131	2.50			
Total	134				

TABLE IV-22

NUMBER OF OFFICE VISITS

Comparison of Means

Training Exposure	Total Mean	Total N	Casework Treatment: Intensive Mean	Intensive N	Casework Treatment: Regular Mean	Regular N
Total	2.2	135	3.5	67	0.9	68
ERE	2.2	68	3.6	34	0.8	34
Control	2.2	67	3.4	33	1.1	34

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation
Social Work	1	224.81	30.38	< .001	Significant
Training	1	0.13	0.02	> .05	Not Significant
Interaction	1	1.24	0.17	> .05	Not Significant
Residual	131	7.40			
Total	134				

TABLE IV-23

NUMBER OF TELEPHONE CONTACTS

Comparison of Means

Training Exposure	Total Mean	Total N	Casework Treatment: Intensive Mean	Intensive N	Regular Mean	Regular N
Total	7.4	135	12.2	67	2.6	68
ERE	7.6	68	12.5	34	2.8	34
Control	7.0	67	11.9	33	2.3	34

Analysis of Variance*

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation
Social Work	1	9.23	68.01	<.001	Significant
Training	1	0.13	0.99	>.05	Not Significant
Interaction	1	0.00**	0.00**	>.05	Not Significant
Residual	131	0.14			
Total	134				

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*The analysis was conducted on the logarithms of (x + 1) to compensate for heterogeneous variances.

**The actual value is .005 or less.

TABLE IV-24

POST-TEST STANFORD-BINET SCORES

Comparison of Means

Training Exposure	Total Mean	Total N	Casework Treatment Intensive Mean	Casework Treatment Intensive N	Casework Treatment Regular Mean	Casework Treatment Regular N
Total	88.4	136	87.6	68	89.3	68
ERE	90.5	68	89.9	34	91.1	34
Control	86.4	68	85.2	34	87.5	34

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation*
Social Work	1	104.12	0.95	$> .05$	Not Significant
Training	1	588.89	5.38	$< .025$	Significant
Interaction	1	10.07	0.09	$> .05$	Not Significant
Residual	132	109.35			
Total	135				

*Evaluated on a one-tailed test at the .05 level.

TABLE IV-25

STANFORD-BINET IQ CHANGES

Comparison of Means

Training Exposure	Total Mean	Total N	Casework Treatment: Intensive Mean	Intensive N	Casework Treatment: Regular Mean	Regular N
Total	-0.9	136	-1.3	68	-0.4	68
ERE	1.1	68	0.8	34	1.4	34
Control	-2.8	68	-3.4	34	-2.2	34

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation*
Social Work	1	25.60	0.25	> .05	Not Significant
Training	1	516.36	5.06	< .025	Significant
Interaction	1	3.24	0.03	> .05	Not Significant
Residual	132	102.09			
Total	135				

*Evaluated on a one-tailed test at the .05 level. See Appendix V.

TABLE IV-26

STANFORD-BINET IQ CHANGES FOR THE CONTROL GROUPS BY SEX

Comparison of Means

Item	Total	Males	Females
Mean	-2.8	-3.7	-2.2
Number	68	27	41

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation*
Between	1	39.33	0.35	> .05	Not Significant
Within	66	111.25			
Total	67				

*Evaluated on a two-tailed test at the .05 level. See Appendix V.

TABLE IV-27

PEABODY POST-TEST SCORES

Comparison of Adjusted Means

Training Exposure	Total Mean	Total N	Casework Treatment: Intensive Mean	Intensive N	Casework Treatment: Regular Mean	Regular N
Total	66.9	128	70.4	64	63.3	64
ERE	70.2	64	73.8	32	66.7	32
Control	63.5	64	67.1	32	59.9	32

Analysis of Covariance of Peabody Post-Test Scores Adjusted for the Effect of Pre-Test Binet IQ Scores

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation*
Social Work	1	1634.46	4.88	<.025	Significant
Training	1	1433.74	4.28	<.025	Significant
Interaction	1	0.24	0.00	>.05	Not Significant
Residual	123	334.95			
Total	126				

*Evaluated on a one-tailed test at the .05 level. See Appendix V.

TABLE IV-28

PEABODY POST-TEST SCORES FOR THE CONTROL GROUPS BY SEX

Comparison of Means

Item	Total	Male	Female
Mean	63.3	69.5	59.1
Number	64	26	38

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation*
Between	1	1,855.52	3.72	> .05	Not Significant
Within	62**	498.39			
Total	67				

*Evaluated on a two-tailed test at the .05 level.

**Four degrees of freedom were lost because missing scores were replaced by estimation from cell means, and appropriate adjustments were made because of unequal values of N.

TABLE IV-29

METROPOLITAN POST-TEST SCORES

Comparison of Adjusted Means

Training Exposure	Total Mean	Total N	Casework Treatment: Intensive Mean	Intensive N	Regular Mean	Regular N
Total	21.9	136	23.2	68	20.6	68
ERE	24.0	68	26.0	34	22.0	34
Control	19.8	68	20.3	34	19.3	34

Analysis of Covariance of Metropolitan Scores Adjusted for the Effect of Pre-Test Binet IQ Scores

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation*
Social Work	1	213.87	3.46	<.05	Significant
Training	1	597.92	9.68	<.0025	Significant
Interaction	1	75.27	1.22	>.05	Not Significant
Residual	131	61.79			
Total	134				

*Evaluated on a one-tailed test at the .05 level. See Appendix V.

TABLE IV-30

METROPOLITAN SCORES FOR ELEVEN CHILDREN WHO CONTINUED IN THE PROJECT

Comparison of Means

Item	Pre-Test	Mid-Test	Post-Test
Mean	15.9	20.7	33.7
Number	11	11	11

Analysis of Variance for Pre- and Mid-Tests

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation
Between	1	127.68	2.43	> .05	Not Significant
Within	20	52.56			
Total	21				

Analysis of Variance For Mid- and Post-Tests

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation
Between	1	929.50	8.71	< .01	Significant
Within	20	106.72			
Total	21				

TABLE IV-31

METROPOLITAN POST-TEST SCORES FOR THE CONTROL GROUPS BY SEX

Comparison of Means

Item	Total	Male	Female
Mean	19.8	18.7	20.4
Number	68	27	41

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation
Between	1	49.03	0.95	> .05	Not Significant
Within	66	51.69			
Total	67				

TABLE IV-32

VINELAND SOCIAL MATURITY CHANGE SCORES

Comparison of Adjusted Means

Training Exposure	Total Mean	Total N	Casework Treatment Intensive Mean	Casework Treatment Intensive N	Casework Treatment Regular Mean	Casework Treatment Regular N
Total	0.7	124	0.6	62	0.9	62
FRE	0.8	62	0.5	31	1.0	31
Control	0.7	62	0.6	31	0.7	31

Analysis of Covariance of Vineland Change Scores Adjusted For Pre-Test Binet IQ Differences

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation*
Social Work	1	343.14	2.69	> .05	Not Significant
Training	1	33.23	0.26	> .05	Not Significant
Interaction	1	162.26	1.27	> .05	Not Significant
Residual	119	127.71			
Total	122				

*Evaluated on a one-tailed test at the .05 level. See Appendix V.

TABLE IV-33

FAMILY FUNCTIONING INSTRUMENT CHANGE SCORES

Comparison of Means

Training Exposure	Total Mean	Total N	Casework Treatment Intensive Mean	Casework Treatment Intensive N	Casework Treatment Regular Mean	Casework Treatment Regular N
Total	0.3	136	0.5	68	0.1	68
ERE	0.3	68	0.5	34	0.1	34
Control	0.3	68	0.4	34	0.1	34

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation*
Social Work	1	434.18	7.47	<.005	Significant
Training	1	3.89	0.07	>.05	Not Significant
Binet IQ	33	50.60	0.87	>.25	Not Significant
Training by Social Work	1	20.65	0.36	>.05	Not Significant
Binet IQ by Social Work	33	30.47	0.52	>.25	Not Significant
Binet IQ by Training	33	38.75	0.67	>.25	Not Significant
Error	33	58.12			
Total	135				

*The main effects of training and treatment and their interaction were evaluated on a one-tailed test at the .05 level, but all other sources were evaluated on a two-tailed test at the .25 level in order to reduce the risk of a Type II error. See Appendix V.

TABLE IV-34

READING ELEMENTS ACHIEVEMENT TEST SCORES

Comparison of Means

Item	Total	Casework Treatment	
		Intensive	Regular
Mean	7.4	7.4	7.3
Number	68	34	34

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation*
Social Work	1	0.13	0.28	> .05	Not Significant
FFI	33	1.28	2.75	< .005	Significant
Error	33	0.47			
Total	67				

*Evaluated on a one-tailed test at the .05 level. See Appendix V.

TABLE IV-35

ABSENCE RATES FOR ERE PARTICIPANTS
AS A PERCENT OF THE TOTAL NUMBER OF SESSIONS AVAILABLE
TO EACH CHILD

Comparison of Means

Item	Total	Casework Treatment Intensive	Regular
Mean	34.0	32.9	34.9
Number	68	34	34

Analysis of Variance

Source of Variance	Degrees of Freedom	Mean Squares	Value of F	Value of P	Evaluation*
Social Work	1	65.03	0.42	> .05	Not Significant
FFI	33	177.93	1.15	> .05	Not Significant
Residual	33	154.60			
Total	67				

*Evaluated on a one-tailed test at the .05 level.

APPENDIX V

Technical Appendix

APPENDIX V

TECHNICAL APPENDIX

The material provided in this portion of the study supplements both the narrative portions of the report and the tables in Appendix IV. The purpose of this appendix is to provide the reader with a somewhat more detailed examination of the methods of data analysis used in the study.

Stanford-Binet Pre-Test Scores

(Table IV-14)

The purpose of analyzing the pre-test Stanford-Binet IQ scores was to determine whether the four study groups were homogeneous in regard to this measure of intelligence. Since the children within Groups I and II and those within Groups III and IV were matched within plus or minus two IQ points, the analysis of pre-test scores was based on a matched groups design. The matching of the children on IQ scores introduced a correlation between the groups which, if not isolated, would inject a large systematic variance into the estimate of error. Thus, significant differences between the pre-test mean scores might go undetected because of an exaggerated estimate of the error term. In order to remove the systematic variance in the error term arising through the use of correlated groups, each of the four study groups was arrayed into rank order sequence according to pre-test Binet scores. This arrangement made it possible to remove from the error term the effect of matching as reflected through the "row effects".

The analysis of the pre-test Stanford-Binet IQ scores took the form of a three-way analysis of variance. The main effects of differences between social work services and training were of primary interest; the third factor isolated was the row effects of matching the children by IQ scores. The mathematical model used in the analysis is shown below (interaction terms are not shown in this or subsequent models):

$$Y_{ijk} = \overline{Y} + A_i + B_j + C_k + e_{ijk} \quad (i = j = 1,2;\ k = 1,34)$$

where:

Y = Binet pre-test scores
A = The effect of training differences
B = The effect of social work treatment differences
C = The effect of matching the students on IQ
e = A random error component.

Since the total of 136 degrees of freedom were used in the analysis, the three-way interaction was used as an estimate of the random error component under the assumption that it was not significant. The two-way interaction between the treatments and the IQ matching was highly significant. It was therefore decided that criterion evaluations must include adequate control over pre-test IQ differences. Since there was no residual term, it was not possible to compare group variances.

Pre-Test FFI Raw Scores, Pre-Test FFI Adjusted Scores, and Pre-Test Vineland Scores

(Tables IV-15, IV-16, and IV-17)

As with pre-test Binet IQ scores, it was necessary to determine whether the four study groups were homogeneous in regard to pre-test measures of family functioning capacity and the social maturity of the children who participated in the experiment. The same mathematical model was used as above with appropriate substitutions of the dependent variable for the analysis of pre-test FFI raw and adjusted scores and pre-test Vineland scores. The effects of IQ matching on the error estimate were again removed through the isolation of row variances, but the main effects of IQ matching and the two-way interactions of IQ with the independent variables (training and treatment) were evaluated at the .25 level on a two-tailed test. The purpose in doing this was to permit greater latitude in discerning the effects of IQ matching. That is, evaluation at the .25 level reduced the risk of concluding "no relationship" between the dependent variable and IQ when in fact such a relationship was present. As with the Binet scores, the three-way interaction was used as the error estimate under the assumption that it was not significant.

Hours of Training

(Table IV-18)

A slightly different problem was seen in relation to the number of hours of exposure to ERE training. It was thought that variation in IQ might be related to the length of time the child elected to remain in the ERE session. Since the children were permitted to terminate the ERE sessions whenever they wished, the relationship between IQ and ERE tolerance could be important. This factor was considered in addition to the need to determine whether the groups had the same number of hours of training. The analysis of data took the form of a two-way analysis of variance according to the following model:

$$Y_{ik} = \overline{Y} + A_i + B_k + e_{ik} \quad (i = 1,2;\ k = 1,34)$$

where:

Y = Hours of training
A = The effect of social work treatment differences
B = The effect of matching the students on IQ
e = A random error component.

Since the control groups received no training, the analysis was based on the experimental groups (Groups I and III). All 68 degrees of freedom were used by the model so that the estimate of error consisted of the two-way interaction under the assumption that it was not significant. The findings indicated that the two groups did not receive the same number of hours of training and that pre-test IQ ratings were related to time spent in training.

Stanford-Binet IQ Change Scores

(Table IV-25)

The analysis of changes from pre-test to post-test in the Binet IQ scores was conducted in two stages. The first stage consisted of a three-way analysis of variance which isolated the effects of differences in training, social work services, the interaction of these two variables, and the effect of pre-test ratings on the Family Functioning Instrument. The effect of pre-test FFI ratings was isolated by putting the Binet change scores in rank order according to FFI pre-test raw scores. The model used for this analysis is shown as follows:

$$Y_{ijk} = \bar{Y} + A_i + B_j + C_k + e_{ijk} \quad (i = j = 1,2;\ k = 1,34)$$

where:

Y = Binet IQ change scores
A = The effect of training differences
B = The effect of social work treatment differences
C = The effect of pre-test FFI differences
e = A random error component.

Note that each difference score was transformed such that $D = (X_2 - X_1)(10) + 25$, where X_2 = post-test and X_1 = pre-test IQ scores. This was done in order to eliminate decimal points and negative numbers. The mean squares shown in Table IV-25 were not decoded, so this must be accounted for if the reader wishes to examine the standard errors, i.e., divide each mean square by $(10)^2$. Again, the high-order interaction was used as the error estimate under the assumption that it was not significant. This was done since the full model used all the degrees of freedom and there was no residual term remaining for the comparison of group variances. The complete analysis is shown in the following table.

Three-Way Analysis of Variance

Source of Variance	df	Sum of Squares	Mean Squares	Value of F	Value of P	Evaluation*
Social Work	1	25.60	25.60	0.21	> .05	Not Significant
Training	1	516.36	516.36	4.33	< .025	Significant
FFI	33	3460.63	104.87	0.88	> .25	Not Significant
Tng x Trtmt	1	3.24	3.24	0.03	> .05	Not Significant
FFI x Trtmt	33	2057.15	62.34	0.52	> .25	Not Significant
FFI x Tng	33	4020.39	121.83	1.02	> .25	Not Significant
Error	33	3937.51	119.32			
Total	135	14020.88				

*The main effects of training and treatment and their interaction were evaluated on a one-tailed test at the .05 level, but all other sources were evaluated on a two-tailed test at the .25 level in order to reduce the risk of a Type II error.

From the above analysis it was concluded that the effect of differences in pre-test FFI ratings had no appreciable effect upon the changes in the Binet IQ scores. Greater latitude was given for any effect of the pre-test FFI ratings to be revealed by increasing the significance level to .25. Thus, the null hypothesis of no FFI effect (C = 0 in the above model) was not rejected. On the basis of these findings, the second stage of the analysis consisted of reducing the full model to the following abbreviated model:

$$Y_{ijk} = \overline{Y} + A_i + B_j + e_{ijk}$$

where all previous definitions remain unchanged. Use of the abbreviated model provided a residual term for the comparison of groups variances. The comparison revealed that the assumption of homogeneous variances was met, and $F_{max} = 4586.12/2755.76 = 1.66$ with 4 and 34 degrees of freedom. Entry into the F_{max} table shows the variances to be homogeneous at $P > .05$.

Binet Change Scores for the Control Groups by Sex

(Table IV-26)

Because of the difference in sex composition among the groups it was necessary to determine whether Binet change score differences could be attributed to differences in sex composition. This was evaluated by comparing the performance of boys and girls in the control groups (Groups II and IV) with the following model:

$$Y_{ij} = \overline{Y} + A_i + e_{ij} \quad (i = 1,2;\ j = 1,34)$$

where:

Y = Stanford-Binet change scores
A = The effect of sex differences
e = A random error component.

An important observation is made in regard to the application of the above model: j = 1,34 represents the use of weighted sums of squares in the analysis. The sum of squares attributed to differences between the groups was obtained from the expression

$$SSB = (\Sigma X_1')^2/N' + (\Sigma X_2')^2/N' - CF$$

where:

$$\Sigma X_1' = (\overline{X}_1)(N')$$

$$\Sigma X_2' = (\overline{X}_2)(N')$$

$$N' = 34$$

The purpose of weighting the sum of scores (multiplication of the group means by $N' = 34$) was to reduce a bias otherwise operating in favor of accepting the null hypothesis. Thus, an effort was made to construct a test which would show whether sex differences contributed to the experimental results. The same model and procedures were followed with respect to the comparison of sex differences for the Peabody post-test scores, so this discussion will not be repeated in the following section.

A final test was conducted in the comparison of the two group variances. With reference to the group residuals, it was found that $F_{max} = 133.05/69.90 = 1.90$. While evaluation from the F_{max} table with 41 and 27 degrees of freedom violates the table assumption of equal values of N, it is noted that the required value of F at the .05 level = 2.07 with df = 30 for two groups. The obtained value, $F = 1.90$, does not therefore indicate a difference in group variances large enough to conclude that the groups were drawn from different populations with respect to the variance of changes in Binet scores.

Peabody Post-Test Scores

(Table IV-27)

The Peabody post-test scores were also analyzed in several steps. The purpose was to evaluate the effect of the independent variables and to control for the effects of both pre-test family functioning ratings and IQ differences. The full model, shown below, controlled the effect of FFI pre-test ratings by isolating row variance, and pre-test IQ differences were controlled through a covariance adjustment:

$$Y_{ijk} = \overline{Y} + A_i + B_j + C_k + bD + e_{ijk} \quad (i = j = 1,2;k = 1,32)$$

where:

Y = Peabody post-test scores
A = The effect of training differences
B = The effect of social work treatment differences
C = The effect of pre-test FFI differences
D = The effect of pre-test IQ differences
b = The regression slope
e = A random error component.

The first step consisted of a three-way analysis of variance. The effect of pre-test FFI scores was controlled by putting the Peabody scores into rank order sequence according to FFI and isolating the row effects. The three-way interaction was used as the error estimate under the assumption that it was not significant. This was done since the model used all the degrees of freedom and there was no residual variance. The complete analysis of variance table is shown below.

Three-Way Analysis of Variance

Source of Variance	df	Sum of Squares	Mean Squares	Value of F	Value of P	Evaluation*
Social Work	1	1444.53	1444.53	2.84	> .05	Not Significant
Training	1	1624.50	1624.50	3.20	< .05	Significant
FFI	31	10612.47	342.34	0.67	> .25	Not Significant
Tng x Trtmt	1	4.50	4.50	0.01	> .05	Not Significant
FFI x Trtmt	31	11762.47	379.43	0.75	> .25	Not Significant
FFI x Tng	31	15238.50	491.56	0.97	> .25	Not Significant
Error	31	15750.50	508.08			
Total	127	56437.47				

*The main effects of training and treatment and their interaction were evaluated on a one-tailed test at the .05 level, but all other sources were evaluated on a two-tailed test at the .25 level in order to reduce the risk of a Type II error.

From the above analysis it was concluded that pre-test differences in FFI ratings had no appreciable effect upon the children's performance on the Peabody test. Therefore, the null hypothesis of "no effect" (C = 0 in the above model) was not rejected, and the model was abbreviated to a two-way analysis with covariance control over the pre-test IQ scores. The abbreviated model is shown below where all previous definitions remain unchanged:

$$Y_{ijk} = \overline{Y} + A_i + B_j + bD + e_{ijk}$$

Through abbreviation of the model, residual variances were obtained for comparison among the groups. The test for homogeneous variances was based upon $F_{max} = 16789.97/10078.97 = 1.67$. With 4 and 32 degrees of freedom, entry into the F_{max} table shows the variances to be homogeneous at $P > .05$.

Residual variances were also compared for the Binet pre-test scores where F_{max} = 5043.72/2047.50 = 2.46. Entry into the F_{max} table with 4 and 32 degrees of freedom shows the variances to be homogeneous at $P > .05$. These tests support the assumption of homogeneous variances required of the abbreviated covariance model, and the following table shows the results of the test for the assumption of homogeneous slopes in the covariance adjustments.

Test of Slopes

Group	df	SSX	SP	SSY	df	b	SSD	Mean Squares
I	31	2047.50	1844.62	10078.97	30	0.90	8417.13	
II	31	2290.87	3103.69	16789.97	30	1.35	12585.06	
III	31	5043.72	3743.38	11343.50	30	0.74	8565.21	
IV	31	4139.50	4133.50	15151.50	30	1.00	11023.99	
					120		40591.39	338.26
Total	124	13521.59	12825.19	53363.94	123	0.95	41199.28	
					3		607.89	151.97

With the above analysis it was found that F = 151.97/338.26 = 0.45; with 3 and 120 degrees of freedom, entry into the F table shows the difference between slopes to be not significant at $P < .01$. The .01 level was used to reduce the risk of a Type I error, that is, to be sure that the slopes were different before abandoning the covariance model. On the basis of these findings it was concluded that the four study groups were drawn from a single population with a common slope. From this point the analysis was continued to a test of the significance of the common slope estimate which is shown below.

Significance of Slopes

Source of Variance	df	Sum of Squares	Mean Squares	Value of F	Value of P	Evaluation*
Slope	1	12164.66	12164.66	37.20	<.0001	Significant
Residual	126	41199.28	326.99			
Total	127	53363.94				

*Evaluated on a two-tailed test at the .05 level.

The final covariance analysis is presented in the following table and was summarized as Table IV-27.

Covariance Analysis

Source of Variance	df	SSX	SP	SSY		df	Mean Squares	Value of F	Value of P*
Social Work	1	6.57	-97.42	1444.53		1	1634.46	4.88	<.025
Training	1	6.57	103.31	1624.50		1	1433.74	4.28	<.025
Interaction	1	7.51	5.81	4.50		1	0.24	0.00	>.05
Residual	124	13521.59	12825.19	53363.94	41199.28	123	334.95		
Total	127								
		13528.16	12727.77	54808.47	42833.74				
		13528.16	12928.50	54988.44	42633.02				
		13529.10	12831.00	53368.44	41199.52				

*Evaluated on a one-tailed test at the .05 level.

Metropolitan Post-Test Scores

(Table IV-29)

The Metropolitan post-test scores were subjected to the same analysis as used above for the Peabody test. Since the same mathematical model applies except for appropriate substitutions in the dependent variable, narrative explanations are not repeated. The following tables show the findings in regard to the Metropolitan scores.

Three-Way Analysis of Variance

Source of Variance	df	Sum of Squares	Mean Squares	Value of F	Value of P	Evaluation*
Social Work	1	181.24	181.24	2.85	> .05	Not Significant
Training	1	614.13	614.13	9.67	< .0025	Significant
FFI	33	1942.60	58.87	0.93	> .25	Not Significant
Tng x Trtmt	1	81.07	81.07	1.28	> .05	Not Significant
FFI x Trtmt	33	2501.01	75.79	1.19	> .25	Not Significant
FFI x Tng	33	2297.12	69.61	1.10	> .25	Not Significant
Error	33	2096.18	63.52			
Total	135	9713.35				

*The main effects of training and treatment and their interaction were evaluated on a one-tailed test at the .05 level, but all other sources were evaluated on a two-tailed test at the .25 level in order to reduce the risk of a Type II error.

From the above, it was concluded that pre-test differences in the FFI ratings had no appreciable effect upon the children's performance on the Metropolitan test. Therefore, the abbreviated model for the two-way analysis of variance was used. The test of homogeneous variances was based upon $F_{max} = 3565.88/1494.26 = 2.39$. With 4 and 34 degrees of freedom, entry into the F_{max} table shows the variances on the Metropolitan test to be homogeneous at $P > .05$. Similarly, the test for homogeneous variances for the pre-test Binet scores was based upon $F_{max} = 5280.12/2189.53 = 2.41$. With 4 and 34 degrees of freedom, entry into the F_{max} table shows these variances to be homogeneous at $P > .05$.

Test of Slopes

Group	df	SSX	SP	SSY	df	b	SSD	Mean Squares
I	33	2189.53	1042.24	3565.88	32	0.476	3069.76	
II	33	2294.03	378.91	1494.26	32	0.165	1431.67	
III	33	5280.12	1478.71	1822.74	32	0.280	1408.62	
IV	33	4950.12	406.06	1954.03	32	0.082	1920.72	
					128		7830.77	61.18
Total	132	14713.80	3305.92	8836.91	131	0.225	8094.13	61.79
					3		263.36	87.79

The ratio of F = 87.79/61.18 = 1.43 with 3 and 128 degrees of freedom is not significant at P <.01. The .01 level was again used to reduce the risk of a Type I error. It was therefore concluded that the slopes were sufficiently similar to assume that the four groups were drawn from a single population with a common slope.

Significance of Slopes

Source of Variance	df	Sum of Squares	Mean Squares	Value of F	Value of P	Evaluation*
Slope	1	742.78	742.78	12.29	<.001	Significant
Error	134	8094.13	60.40			
Total	135	8836.91				

*Evaluated on a two-tailed test at the .05 level.

The final covariance analysis is presented in the following table and was summarized as Table IV-29.

Covariance Analysis

Source of Variance	df	SSX	SP	SSY		df	Mean Square	Value of F	Value of P*
Social Work	1	27.36	-70.42	181.24		1	213.87	3.46	< .05
Training	1	2.12	36.12	614.13		1	597.92	9.68	< .0025
Interaction	1	2.12	13.13	81.07		1	75.27	1.22	> .05
Residual	132	14713.80	3305.92	8836.91	8094.13	131	61.79		
Total	135								
		14741.16	3235.50	9018.15	8308.00				
		14715.92	3342.04	9451.04	8692.05				
		14715.92	3319.05	8917.98	8169.40				

*Evaluated on a one-tailed test at the .05 level.

Vineland Change Scores

(Table IV-32)

The model used in the analysis of the Peabody test scores was also used in the study of the Vineland Social Maturity change scores, and the only changes in the model were appropriate substitutions in the dependent variable. The following table shows the complete results of the three-way analysis of variance.

Three-Way Analysis of Variance

Source of Variance	df	Sum of Squares	Mean Squares	Value of F	Value of P	Evaluation*
Social Work	1	316.16	316.16	3.16	< .05	Significant
Training	1	33.03	33.03	0.33	> .05	Not Significant
FFI	30	2745.19	91.51	0.91	> .25	Not Significant
Tng x Trtmt	1	167.22	167.22	1.67	> .05	Not Significant
FFI x Trtmt	30	5602.84	186.76	1.86	< .25	Significant
FFI x Tng	30	4361.97	145.40	1.45	< .25	Significant
Error	30	3002.78	100.09			
Total	123	16229.19				

*The main effects of training and treatment and their interaction were evaluated on a one-tailed test at the .05 level, but all other sources were evaluated on a two-tailed test at the .25 level to reduce the risk of a Type II error.

On the basis of the findings contained in the above table, it was concluded that pre-test differences in the FFI ratings had no appreciable effect upon changes on the Vineland Social Maturity Scale. The reader will note that a significant interaction between FFI pre-test scores and treatment differences and a significant interaction between FFI pre-test scores and training differences were observed at the .25 level. These significant interactions suggest there is merit in conducting a covariance control over FFI pre-test scores. This was not done, however, for two reasons: the research staff were not certain that test conditions outlined by the Vineland manual were followed with sufficient rigor to justify the additional analysis; and it was believed that a more refined analysis should be conducted on the basis of sample data which insured random assignment across the two levels of social work treatment. Thus, the significant difference found between the two levels of social work treatment on a one-tailed test at the .05 level was ignored, and the research staff resorted to the abbreviated model with a covariance control over Binet pre-test scores.

Each difference score was transformed such that $D = (X_2 - X_1)(10) + 31$, where X_2 = post-test and X_1 = pre-test Vineland scores. This was done in order to eliminate decimal points and negative numbers. The mean squares shown in Table IV-32 were not decoded, so this must be accounted for if the reader wishes to examine the standard errors.

In the abbreviated model, the test of homogeneous variances was based upon $F_{max} = 6684.20/2839.48 = 2.35$. With 4 and 31 degrees of freedom, entry into the F_{max} table shows the group variances in the Vineland change scores to be homogeneous at $P > .05$. Similarly, the test of homogeneous variances for the pre-test Binet scores was based upon $F_{max} = 5045.68/2031.87 = 2.48$. With 4 and 31 degrees of freedom, entry into the F_{max} table shows these variances to be homogeneous at $P > .05$.

Test of Slopes

Group	df	SSX	SP	SSY	df	b	SSD	Mean Squares
I	30	2031.87	564.68	6684.20	29	0.278	6527.27	
II	30	2189.94	-482.97	2839.48	29	-0.220	2732.97	
III	30	5045.68	-1560.97	3287.10	29	-0.309	2804.19	
IV	30	4269.36	-1162.00	2902.00	29	-0.272	2585.74	
					116		14650.17	126.29
TOTAL	120	13536.85	-2641.26	15712.78	119	-0.195	15197.43	127.71
					3		547.26	182.42

The ratio of $F = 182.42/126.29 = 1.44$ with 3 and 116 degrees of freedom is not significant at $P < .01$. The .01 level was again used to reduce the risk of a Type I error. It was therefore concluded that the slopes were sufficiently similar to assume that the four groups were drawn from a single population with a common slope.

Significance of Slopes

Source of Variance	df	Sum of Squares	Mean Squares	Value of F	Value of P	Evaluation*
Slope	1	515.35	515.35	4.14	< .05	Significant
Error	122	15197.43	124.57			
Total	123	15712.78				

*Evaluated on a two-tailed test at the .05 level.

A final covariance analysis is presented in the following table and was summarized as Table IV-32.

Covariance Analysis

Source of Variance	df	SSX	SP	SSY		df	Mean Square	Value of F	Value of P*
Social Work	1	14.91	68.67	316.16		1	343.14	2.69	>.05
Training	1	0.01	0.52	33.03		1	33.23	0.26	>.05
Interaction	1	0.98	-12.78	167.22		1	162.26	1.27	>.05
Residual	120	13536.85	-2641.26	15712.78	15197.43	119	127.71		
Total	123								
		13551.76	-2572.59	16028.94	15540.57				
		13536.86	-2640.74	15745.81	15230.66				
		13537.83	-2654.04	15880.00	15359.69				

*Evaluated on a one-tailed test at .05 level.

Family Functioning Instrument Change Scores

(Table IV-33)

The same model as used on the analysis of pre-test Binet IQ scores was applied to the analysis of Family Functioning Instrument change scores with appropriate substitutions in the dependent variable. Each change score was coded such that $D = (X_2 - X_1)(10) + 22$, where X_2 = post-test scores and X_1 = pre-test scores. The mean squares in Table IV-33 were not decoded, and the reader should therefore divide each mean square by $(10)^2$ if an examination of standard errors is desired.

Three-Way Analysis of Variance

Source of Variance	df	Sum of Squares	Mean Squares	Value of F	Value of P	Evaluation
Social Work	1	434.18	434.18	7.47	<.005	Significant
Training	1	3.89	3.89	0.07	>.05	Not Significant
Binet IQ	33	1669.74	50.60	0.87	>.25	Not Significant
Tng x Trtmt	1	20.65	20.65	0.36	>.05	Not Significant
Binet x Trtmt	33	1005.57	30.47	0.52	>.25	Not Significant
Binet x Tng	33	1278.86	38.75	0.67	>.25	Not Significant
Error	33	1918.10	58.12			
Total	135					

Reading Elements Achievement Test Scores

(Table IV-34)

Since REAT scores were not obtained for the two control groups, the following represents a two-way analysis of variance for the experimental groups (I and III). The analysis was conducted to isolate the effect of differences in social work treatment and to control for the effect of differences in pre-test FFI raw scores. The model for the analysis is shown as follows:

$$Y_{ij} = \overline{Y} + A_i + B_j + e_{ij} \quad (i = 1,2;\ j = 1,34)$$

where:

Y = Reading Elements Achievement Test scores
A = The effect of social work treatment
B = The effect of FFI pre-test scores
e = A random error component

The following table shows the complete analysis of variance with the sums of squares. Since the model required the use of all degrees of freedom, the two-way interaction was used as the error estimate.

Analysis of Variance

Source of Variance	df	Sum of Squares	Mean Squares	Value of F	Value of P	Evaluation
Social Work	1	0.13	0.13	0.16	> .05	Not Significant
Binet	33	30.31	0.92	1.12	> .05	Not Significant
Error	33	27.37	0.83			
Total	67					

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